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POLLUTION OF LAKE ERIE AND ITS TRIBUTARIES (INDIANA, MICHIGAN, NEW YORK, OHIO, PENNSYLVANIA). PROCEEDINGS OF CONFERENCE HELD AT CLEVELAND, OHIO ON JUNE 27, 1969. VOLUME I.

Federal Water Pollution Control Administration
Washington, D.C.

1969

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PROCEEDINGS

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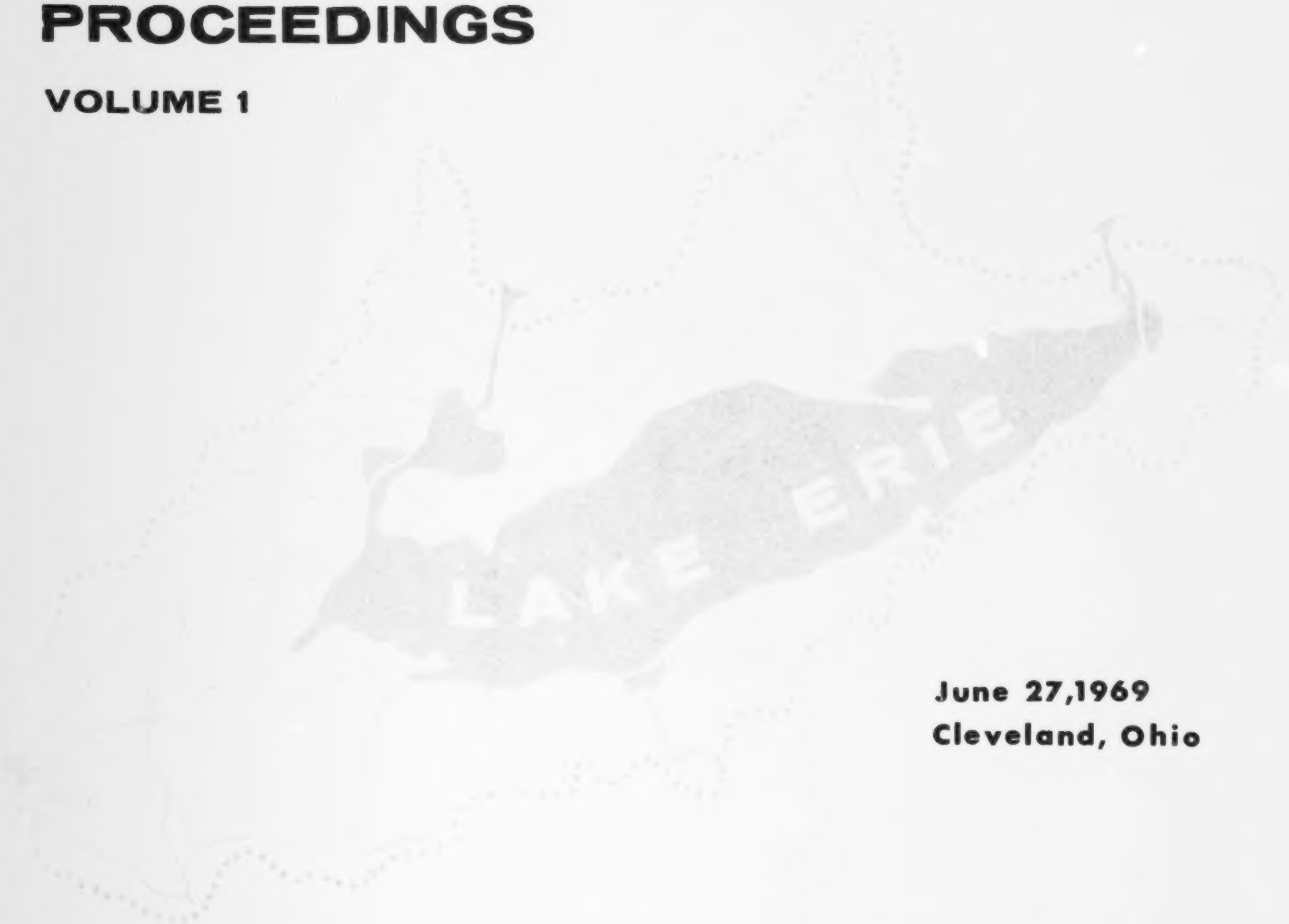

June 27,1969
Cleveland, Ohio

PROGRESS EVALUATION MEETING

In the Matter of Pollution of Lake Erie and its Tributaries (Indiana, Michigan, New York, Ohio, Pennsylvania.)

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U.S. DEPARTMENT OF THE INTERIOR • FEDERAL WATER POLLUTION CONTROL ADMINISTRATION

353

PROGRESS EVALUATION MEETING IN THE MATTER OF POLLUTION OF LAKE ERIE AND ITS TRIBUTARIES (INDIANA-MICHIGAN-NEW YORK-OHIO-PENNSYLVANIA)

Sheraton-Cleveland Hotel
Cleveland, Ohio
June 27, 1969

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Progress Evaluation Meeting in the Matter of Pollution of Lake Erie and Its Tributaries (Indiana-Michigan-New York-Ohio-Pennsylvania), held at the Sheraton-Cleveland Hotel, Cleveland, Ohio, on June 27, 1969, at 9:00 a.m.

OPENING STATEMENT:

Carl L. Klein, Assistant Secretary for
Water Quality and Research, U.S. Department
of the Interior, Washington, D.C.

PRESIDING:

Murray Stein, Assistant Commissioner for
Enforcement, Federal Water Pollution
Control Administration, U.S. Department
of the Interior, Washington, D.C.

CONFEREES:

Dwight Metzler, Deputy Commissioner,
New York State Department of Health,
Division of Pure Waters, Albany, New York

George H. Eagle, Chief Engineer, Ohio
Department of Health, Columbus, Ohio

Blucher A. Poole, Technical Secretary,
Indiana Stream Pollution Control Board,
Indianapolis, Indiana

CONFEREES (Continued):

Walter A. Lyon, Director, Division of Sanitary Engineering, Pennsylvania Department of Health, Harrisburg, Pennsylvania

Ralph W. Purdy, Chief Engineer, Michigan Water Resources Commission, Lansing, Michigan

Perry E. Miller, Director, Bureau of Engineering, Indiana State Board of Health, Indianapolis, Indiana

H. W. Poston, Regional Director, Great Lakes Region, Federal Water Pollution Control Administration, U.S. Department of the Interior, Chicago, Illinois

PARTICIPANTS:

Hon. Richard D. McCarthy, Member of Congress from the 39th Congressional District of the State of New York (statement read by Mr. Frank Hall)

F. B. Frost, Chief Engineer, Michigan Water Resources Commission, Lansing Michigan

Gerald J. Remus, General Manager, Detroit Metropolitan Water Services, Detroit, Michigan

PARTICIPANTS (Continued):

Eugene F. Seebald, Associate Director, Divison of Pure Waters, New York State Department of Health, Buffalo, New York

Dr. Edward Martin, Director, Clean Water Task Force, Cleveland, Ohio

Ned Williams, Executive Director, Ohio Water Development Authority, Columbus, Ohio

John R. Wolfs, City Engineer, Commissioner of Engineering and Construction, Cleveland, Ohio

James E. Frook, Commissioner of Sewage Disposal, Toledo, Ohio

James C. Haube, Chief Chemist, Toledo Division of Sewage Didposal, Toledo, Ohio

Mrs. June M. Brown, League of Women Voters, Toledo, Ohio

Mrs. James H. Angel, Chairman, Citizens for Land and Water Use, Cleveland, Ohio

Charles Marquette, Water Pollution Chairman, Forest City Civic Association, Cleveland, Ohio

James O'Keefe, International Representative, United Auto Workers, Department of Conservation and Resource Development, Columbus, Ohio

Jesse L. Hicks, Assistant State Conservationist, United States Department of Agriculture, Soil Conservation

PARTICIPANTS (Continued):

Service, Columbus, Ohio

Lloyd L. Harrold, Research Leader, United States Department of Agriculture, Soil and Water Conservation Research, Coshocton, Ohio

George L. Harlow, Director, Lake Erie Basin Office, Federal Water Pollution Control Administration, Cleveland, Ohio

W. A. Steggles, Ontario Water Resources Commission, Ontario, Canada

Merrill Gamet, Chief, Federal Activities Coordination, Federal Water Pollution Control Administration, Chicago, Illinois

ATTENDEES:

Mr. A. V. Agnew
Utilities Superintendent
City of Lorain
1106 Firs Street
Lorain, Ohio

Mr. M. L. Alexander
Environmental Engineer
Ford Motor Company
The American Road
Dearborn, Michigan 48121

Mr. Robert H. Anderson
Manager
Stanley Consultants
6659 Pearl Road
Cleveland, Ohio 44130

Mrs. James H. Angel
Chairman, Citizens for
Land & Water Use
2084 Elbur Avenue
Cleveland, Ohio 44107

Miss Mary Ansbro
Editor, Water in the News
Soap & Detergent Assn.
485 Madison Avenue
New York, New York 10022

Kathryn Asman
Intern
Dept. of Public Utilities
Cleveland, Ohio

Mr. Alèx Balazs
Chemist
City of Cleveland
2785 Broadway
Cleveland, Ohio 44115

Mr. Richard Bene
Public Relations
Utilities Department
City of Cleveland
4542 Warrensville Center Rd.
Cleveland, Ohio 44128

Mr. D. E. Benedict
Chief, Mechanical Engineering
Branch
NASA, Plum Brook Station
Sandusky, Ohio

Mr. Benny J. Allen
3459 West 90 Street
Cleveland, Ohio

Mr. John W. Beckman
Ch.-Subcom. Ecological
Problems of Great Lakes
N.Y.S. Legislature (Assembly)
State Capitol, Albany, N. Y.

Mr. Fred P. Biery
Engineer, Monroe County
Monroe, Michigan 48161

Mr. Michael Benzon, Jr.
Engineer, Wheeler & Melena, Inc.
6907 Brookpark Road
Parma, Ohio 44129

Mr. L. F. Birkel
Superintendent, Water Management
Republic Steel Corporation
Cleveland, Ohio

Mr. John M. Bohunsky
Regional Engineer
Michigan Water Resources Commission
8th Floor, Mason Building
Lansing, Michigan

Mr. J. R. Borgerding
Manager, Central Services
Goodyear Tire & Rubber
1144 East Market Street
Akron, Ohio

J. Hayden Boyd
Asst. Professor of Economics
Ohio State University
1775 S. College
Columbus, Ohio 43210

Mrs. June Brown
League of Women Voters of
Lucas County
3302 Brantford Road
Toledo, Ohio 43606

Mr. Douglas M. Brenner
Aid - Dept. of Public Utilities
Cleveland, Ohio 44106

Mr. Theodore E. Brenner
Research Director
Soap & Detergent Association
485 Madison Avenue
New York, New York 10022

Mr. S. D. Bresler
Chairman, Ohio Water
Development Authority
1425 Hill Street
Lima, Ohio 45804

Mr. Paul Brokaw
Admin. Aide to
Congressman Wm. E. Minshall
2951 Federal Building
Cleveland, Ohio 44199

Mr. Art Buehler
Summer Aid
City of Cleveland
11306 Hessler
Cleveland, Ohio 44106

Mr. Frank Butrico
Director, Environmental
Sciences Program
Battelle Memorial Institute
1755 Massachusetts Ave., N.W.
Washington, D. C. 20036

Mr. R. B. Carswell
Staff
Goodyear Tire & Rubber
Akron, Ohio

Mr. Fred R. Cheek, P. E.
Director, Public Work Div.
Southeast Mich. Council of
Governments
810 Book Building
Detroit, Michigan 48226

Mr. Alfred L. Cherry, Jr.
Director, Westerly Wastewater
Purification Plant
City of Cleveland
3673 Lynnfield Road
Cleveland, Ohio 44122

Agnes Clark
President, League of Women Voters
of Euclid
27370 Markbarry Drive
Euclid, Ohio 44132

Mr. Basil G. Constantelos
Civil Engineer
Easterly Pollution Control-Cleve.
14101 Lakeshore Boulevard
Cleveland, Ohio 44110

Mr. Leonard T. Crook
Planning Director
Great Lakes Basin Commission
2200 North Campus Boulevard
Ann Arbor, Michigan 48105

Mr. J. M. Dempster
Standard Oil Co. (Ohio)
Midland Building
Cleveland, Ohio

Capt. W. E. Dennis
U. S. C. G.
Commander, 9th Coast Guard District
Federal Building
Cleveland, Ohio 44199

Mr. Wayne E. Denniston
District Engineer
Michigan Water Resources Commission
Pt. Manittee State Game Area
Rockwood, Michigan 48173

Mr. Leroy A. Denslow
Reporter
Chronicle-Telegram
East Street
Elyria, Ohio

Mrs. Harry Dodds
President, League of Women Voters
38 Pinehurst Drive
Eastlake, Ohio 44094

Dorsey, Mrs. Robert T.
Civic Chairman
College Club Garden Club and
Four Corners
3726 Tolland Road
Shaker Heights, Ohio 44132

Mr. David Dunn
Superintendent
City of Akron
2209 Akron Peninsula Road
Akron, Ohio 44313

Mr. Phillip Edelstein
Clean Water Task Force
City of Cleveland
1825 Lakeside Avenue
Cleveland, Ohio

Mr. Edward V. Ehrbar
Environmental Control
Engineer
Lubrizol Corporation
29600 Lakeland Boulevard
Wickliffe, Ohio

Mr. Floyd C. Elder
Research Scientist
Canada Centre for Inland Waters
P. O. Box 5050
Burlington, Ontario, Canada

Mr. Clarence Emerich
Water Treatment Superintendent
Lorain Water Treatment Plant
1106 First Street
Lorain, Ohio

Mr. S. H. Estill
Izaak Walton League
3577 Cummings Road
Cleveland, Ohio 44118

Mr. Donald Factor
PPG Industries
P. O. Box 31
Barberton, Ohio

Mr. Paul Flanigan
Engineer
Ohio Department of Health
P. O. Box 118
Columbus, Ohio

Mr. Robert Frato
District Sanitary Engineer
Ohio Department of Health
2025 Second Street
Cuyahoga Falls, Ohio

Mr. James E. Frook
Commissioner of Sewage Disposal
City of Toledo
Bay View Park
Toledo, Ohio 43611

Mr. F. B. Frost
Chief Engineer
Michigan Water Resources Commission
Mason Building
Lansing, Michigan

Mr. S. L. Frost
Deputy Director - Water
Ohio Dept. of Natural Resources
Columbus, Ohio 43215

Mr. Lawrence W. Fulton
Resident Engineer
Jones & Henry Engineers, Ltd.
2000 West Central Avenue
Toledo, Ohio

Mr. John C. Funk
Superintendent
Waste Water Treatment
City of Monroe
City Hall
Monroe, Michigan 48161

Mr. John J. Garner
District Engineer
Three Rivers Watershed District
1917 Superior Building
Cleveland, Ohio 44114

Mr. George Garrett
Engineer
Ohio Department of Health
Columbus, Ohio

Mr. Arthur S. Gedeon
Chemist, FWPCA
21929 Lorain Road
Cleveland, Ohio 44126

Mr. Walter E. Gerdel
Commissioner
Division of Water Pollution Control
1825 Lakeside Avenue
Cleveland, Ohio

Mr. Harry De R. Gibbons
Partner
H. F. Ludwig & Assoc.
601 Rockwell Avenue
Cleveland, Ohio

Mr. Joseph Goodman
715 Prospect Avenue
Cleveland, Ohio 44115

Mr. Marshall S. Goulding, Jr.
Project Manager
Stanley Consultants
6659 Pearl Road
Cleveland, Ohio 44130

Mr. James L. Greener
District Sanitary Engineer
Ohio Department of Health
2025 Second Street
Cuyahoga Falls, Ohio

Mr. Charles W. Gullickson
Manager, Technical
Pennwalt Corporation
4655 Biddle
Wyandotte, Michigan

Mr. David Hahlen
Manager, New Ventures
Diamond Shamrock Corp.
300 Union Commerce Building
Cleveland, Ohio 44115

Mr. Richard D. Hall
Diamond Shamrock Corp.
300 Union Commerce Building
Cleveland, Ohio 44115

Mrs. J. L. Hanna
Water Resources Chairman
League of Women Voters of Euclid
454 East 222 Street
Euclid, Ohio 44123

Mr. George L. Harlow
Director, Lake Erie Basin Office
FWPCA, 21929 Lorain Road
Cleveland, Ohio 44126

Mr. Terrence Harmon
Biologist
Natural Science Museum
10600 East Blvd.
Cleveland, Ohio 44106

Mr. Lloyd Harrold
Research Leader
USDA, Soil and Water
Conservation Research
Coshocton, Ohio 43812

Mr. Robert P. Hartley
Chief, Technical Activities Branch
Lake Erie Basin Office
FWPCA, 21929 Lorain Road
Cleveland, Ohio 44126

Mr. Douglas C. Hasbrouck
Principal District Sanitary Engineer
Northwest District
Ohio Department of Health
2025 2nd Street
Cuyahoga Falls, Ohio

Mr. James E. Hayman
Process Engineer
Harshaw Chemical Company
1000 Harvard Avenue
Cleveland, Ohio

Mr. Norman Heck
Supervisor, Monroe Twp.
3903 Walbain
Monroe, Michigan

Mr. W. B. Hendershot
Division of Water
Ohio Dept. of Natural Resources
Front Street
Columbus, Ohio 43216

Mr. Jesse L. Hicks
Assistant State Conservationist
USDA, Soil Conservation Service
311 Old Federal Building
Columbus, Ohio 43215

Mr. Tony Hofle
Plant Engineering
Warner & Swasey Co.
5701 Carnegie
Cleveland, Ohio

Mr. W. C. Holbrook
Senior Environmental Engineer
B. F. Goodrich Chemical Co.
3135 Euclid Avenue
Cleveland, Ohio 44115

Mr. George E. Hubbell
President
Hubbell, Roth & Clark, Inc.
2709 Telegraph Road
Bl-omfield Hills, Michigan

Mr. Warren R. Hull
One Bratenahl Place
Bratenahl, Ohio 44108

Mr. J. Jeter
Sales Engineer
Dow Chemical
55 Public Square
Cleveland, Ohio

Mr. C. O. Jones
Assistant Plant Manager
The Sherwin-Williams Co.
P. O. Box 310
Ashtabula, Ohio 44004

Mr. Anthony Kane
Administrative Aid
City of Cleveland
13720 Shaker Blvd., 503
Cleveland, Ohio

Mr. Michael F. Kelly
Ph. D. Student
State University of N. Y.
at Buffalo
157 McKinley Avenue
Kenmore, New York 14217

Mr. Donald G. Kirk
Senior Research Chemist
Hammermill Paper Co.
Erie, Pennsylvania 16512

Miss Betty Klaric
Reporter
The Cleveland Press
901 Lakeside
Cleveland, Ohio

Ellen M. Knox
Academic Council on Environmental
Problems
Laurel School
Shaker Heights, Ohio

Debbie Kosid
Academic Council on Environmental
Problems
307 Corning Drive
Bratenahl, Ohio

Mr. Edward A. Kramer
Program Advisor
Lake Erie Basin Office
FWPCA, 21929 Lorain Rd.
Cleveland, Ohio 44126

Mr. David E. Kuivinen
Chemist
NASA, Lewis Research Center
21000 Brookpark Road
Cleveland, Ohio 44135

Mr. Richard Kury
Engineer
City of Cleve. Task Force
1825 Lakeside
Cleveland, Ohio

Mr. L. B. O'Leary
Director, Lake Huron Basin Office
FWPCA, Grosse Ile, Michigan

Mr. Harold M. Leonhard
Superintendent of Sewage Treatment
Wayne Co. (Mich.) Metro. Sewage System
797 Central
Wyandotte, Michigan

Mr. Gregory Leopold
26609 Jefferson Ct.
Bay Village, Ohio

Mr. Carl Lesher
Associate
Havens & Emerson
Leader Building
Cleveland, Ohio 44114

Mr. Ray Lewis
Cleveland News Bureau
55 Public Square
Cleveland, Ohio 44113

Sue Liska
3806 Wood Avenue
Parma, Ohio 44134

Mr. Michael Long
Fishery Biologist
Bureau of Commercial Fisheries
5 Research Drive
Ann Arbor, Michigan

J. B. Lynn
Lt. Commander, U.S.C.G.
District Legal Office
1240 East 9 Street
Cleveland, Ohio

Grace McDonald
League of Women Voters of
Mentor
9071 Lake Shore
Mentor, Ohio 44060

Mr. Robert G. McGuider
The Plain Dealer
1801 Superior
Cleveland, Ohio

Mr. Howard Maier
Admin. Aide
Clean Water Task Force
Cleveland Utilities Dept.
1825 Lakeside Avenue
Cleveland, Ohio 44114

Mr. Charles Marquette
Air and Water Pollution
Control Chairman
Forest City Civic Association
Cleveland, Ohio

Mr. Stephen Megregian
Director, Water Resources
Environmental Development, Inc.
Suite 209
1000 Vermont, N. W.
Washington, D. C. 20005

Mr. Philip Q. Maiorana
Superintendent, Water Pollution
City of Lorain
1150 West 10th
Lorain, Ohio

Mr. Christopher T. Mark
Admin. Aide
City of Cleveland
20 North Pleasant St.
Oberlin, Ohio

Edward J. Martin
Director, Clean Water Task Force
City of Cleveland
1825 Lakeside Avenue
Cleveland, Ohio 44114

Mr. Dwight Metzler
Deputy Commissioner
New York State Dept. of Health
Albany, New York

Mr. Perry E. Miller
Director, Bureau of Engineering
Indiana Stream Pollution Control Bd.
1330 West Michigan Street
Indianapolis, Indiana

Mr. S. Miller
The Associated Press
1801 Superior
Cleveland, Ohio 44114

Mr. Robert Mintz
Intern
Dept. of Public Utilities
11420 Hessler
Cleveland, Ohio

Mr. Joseph Monkoski
Civil Engineer
National Park Service
143 South Third Street
Philadelphia, Pa. 19106

Mrs. Howard T. Moore
Water Resources Chairman
League of Women Voters of Ohio
11942 Auburn
Chardon, Ohio 44024

Mr. [illegible]
League of Women Voters of Euclid
52 East [illegible] Street
Euclid, Ohio 44123

Mr. Frank A. Myers
Burroughs Nature Club
Cleve. Audubon Society
19200 North Park Blvd.
Shaker Heights, Ohio 44122

Mr. David B. Nelson
R & D Marketing Representative
Monsanto Research Corporation
1515 Nicholas Road
Dayton, Ohio 45407

Mr. Edwin F. Neubauer
Consulting Engineer
City of Cleveland
Clean Water Task Force
1210 Irving Avenue
Cleveland, Ohio 44109

Mr. Robert E. O'Connel
Chief Engineer
Div. of Sewage & Disposal
City of Toledo
Toledo, Ohio

Mr. James P. O'Keeffe
International Repr.
United Auto Workers
1515 W. Lane Avenue
Columbus, Ohio 43221

Mr. Erwin J. Odeal
District Sanitary Engineer
Ohio Dept. of Health
2025 2nd Street
Cuyahoga Falls, Ohio

Dr. Paul Olynyk
Assoc. Professor
Cleveland State University
Cleveland, Ohio 44115

Mr. Carl Palonen
Chief Process Engineer
Peerless Division
American Cement Corp.
8941 West Jefferson
Detroit, Michigan

Mr. A. G. Payne
Chemist
Procter & Gamble
Cincinnati, Ohio

Mr. Charles G. Pottit
Manager Water Supply
65 South High Street
Akron, Ohio 44308

Mr. P. R. Pine
Consultant
7379 Pearl Road
Cleveland, Ohio 44130

Mr. Russell C. Mt. Pleasant
Sanitary Engineer
New York State Dept. of Health
84 Holland Avenue
Albany, New York 12208

Mr. Chris Potos
Chief of Laboratories
Lake Erie Basin Office
FWPCA, 21929 Lorain Road
Cleveland, Ohio 44126

Mr. Don Powell
Supv. Process Engineer
Mobil
Woodhaven, Michigan

Mr. Ralph Purdy
Executive Secretary
Michigan Water Resources Commission
Lansing, Michigan

Mr. Douglas E. Ralston
Repr. Ashbrook-Mechanical Aerators
3397 Bradford Road
Cleveland, Ohio 44118

Mr. E. B. Ransom
Assistant Executive Director
Ohio Water Development Authority
50 West Broad Street
Columbus, Ohio

Mr. Bertram C. Raynes
Vice President-Research
Rand Development Corporation
Cleveland, Ohio

Mr. J. W. Reinders
Marketing Diversification
Schlumberger
5000 Gulf Freeway
Houston, Texas

Mr. Gerald Remus
General Manager
Detroit Water System
Detroit, Michigan

Mr. John E. Richards
Ohio Department of Health
Columbus, Ohio

Mr. L. E. Rigby
Chief Engineer
F. G. Browne & Associates
121 W. Center Street
Marion, Ohio

Mr. Brent W. Robbins
Attorney
Bethlehem Steel Corp.
Bethlehem, Pa.

Mr. Gilles Robert
Business Manager
Raytheon Company
33 Union St.
New London, Conn.

Mr. George Rosenfeld
President
The Clear Water Systems Co.
78 Adams Street
Berea, Ohio

Mr. Ray Roth
Chief Civil Engineer
Bureau of Industrial Wastes
City of Cleveland
2785 Broadway
Cleveland, Ohio

Mr. Robert W. Ruch
Mechanical Engineer
NASA, Plum Brook Station
Sandusky, Ohio

Mr. K. K. Saigal
Project Engineer
Dalton Dalton Little
979 The Arcade
Cleveland, Ohio 44114

Mr. James P. Schafer
Chief of Laboratories
City of Cleveland
2785 Broadway Ave.
Cleveland, Ohio 44115

Mr. R. G. Schuessler
TS&D, Dow Chemical
2020 Abbott Road
Midland, Michigan 48640

Mr. Eugene F. Seebald
Associate Director
Division of Pure Waters
New York State Dept. of Health
84 Holland Avenue
Albany, New York

Mr. M. T. Shiomi
Scientific Officer
Canada Centre for Inland Waters
Dept. of Energy, Mines & Resources
867 Lakeshore Road
Burlington, Ontario, Canada

Leila Shipawa
League of Women Voters
510 Jeannette Drive
Cleveland, Ohio

Miss Ellen Shub
Researcher
NBC News
30 Rockefeller Center
New York, New York

Mr. Gary M. Siegel
Associate
Havens & Emerson
1220 Leader Building
Cleveland, Ohio 44114

Mr. E. A. Spearing
Senior Engineer
E. I. duPont
Cleveland, Ohio

Mrs. Evelyn Stebbins
Chairman, Three Rivers Group
League of Women Voters
705 Elmwood
Rocky River, Ohio 44116

Mr. W. A. Steggles
Ontario Water Resources Commission
135 St. Clair Avenue
Toronto, Ontario

Mr. Edward F. Stevenson
Engineer
NASA, Lewis Research Center
21000 Brookpark Road
Cleveland, Ohio

Mr. W. R. Taylor
Manager-Engineering
Diamond Shamrock Corporation
300 Union Commerce Bldg.
Cleveland, Ohio

Mrs. Edward Tekieli
League of Women Voters of Euclid
5 East 221 Street
Euclid, Ohio 44123

Mr. William A. Telliand
Technical Director
Environmental Pollution Control
20403 Solon Road
Solon, Ohio

Mr. Richard S. Thomas
Chemist
Allison Division of Gen. Motors
6200 Riverside
Cleveland, Ohio

Mr. Walter M. S. Tresville
Asst. Commissioner
Water Pollution Control
Cleveland Clean Water Task Force
Southerly Wastewater Plant
6000 Canal Road
Cuyahoga Heights, Ohio

Mr. Richard A. Tubb
Leader, Ohio Cooperative Fishery Unit
U. S. Bureau of Sport Fisheries and Wildlife
1735 Neil Avenue
Columbus, Ohio 43210

Mr. Antone Vjhelyi
City Auditor
City of Lorain
City Hall
West Erie Avenue
Lorain, Ohio 44052

Mr. Henry J. Vyhnalek
Supr. Chemical Engineer
Cleveland Electric Illuminating Co.
P. O. Box 5000
Cleveland, Ohio

Mr. George H. Watkins
Executive Director
Lake Erie Watershed Conservation Foundation
1917 Superior Building
Cleveland, Ohio

Mr. Rodgers L. Way
Sales Engineer
Hytek International Corporation
13721 Bennington Avenue
Cleveland, Ohio 44135

Mr. E. C. Weal
Biologist
Ohio Department of Health
450 East Town Street
Columbus, Ohio

Mr. George J. Weidner, U.S.C.G.
Ch. Int. Law Enforcement
9th Coast Guard District
Federal Building
Cleveland, Ohio

Mr. Joseph G. Weinrub
Chief of Design Branch
Buffalo District
Corps of Engineers
1776 Niagara Street
Buffalo, New York

Mr. William L. West
Acting Chief, Enforcement Br.
FWPCA, Ohio Basin Region
303 Methodist Building
Wheeling, W. Va.

Katherine Whitehouse
Academic Council on Environmental Problems
4896 Middledale Road
Cleveland, Ohio 44124

Mr. R. M. Whitt
Plant Manager
Sherwin Williams Co.
Box 6027
Cleveland, Ohio

Mr. Ned E. Williams
Executive Director
Ohio Water Development Authority
2340-50 W. Broad St.
Columbus, Ohio

Mr. John Wilson
Chief, Data Processing
FWPCA, Lake Erie Basin Office
21929 Lorain Rd.
Cleveland, Ohio 44126

Mr. Wayne L. Wingert
Environmental Improvement Engineer
Detroit Edison
2000 2nd Avenue
Detroit, Michigan 48226

Mr. A. R. Winklhofer
Chief, Field Operations
FWPCA, Lake Erie Basin Office
21929 Lorain Rd.
Cleveland, Ohio 44126

Mr. John J. Wirts
Cleveland Easterly Pollution Control Center
14021 Lake Shore Boulevard
Cleveland, Ohio 44110

Mr. Marshall Wolff
Administrative Aide
City of Cleveland
H-31 Winthrop House
Harvard University
Cambridge, Mass. 02138

Mr. John R. Wolfs
City Engineer
City of Cleveland
518 City Hall
Cleveland, Ohio 44114

Mr. Michael Woods
Science Writer
The Toledo Blade
541 Superior
Toledo, Ohio

Mr. George F. Wyman
General Plant Manager
The Sherwin-Williams Co.
2900 Middle Road, Box #310
Ashtabula, Ohio 44004

Mr. Donald J. Yark
Director of Public Utilities
City of Toledo
550 North Erie
Toledo, Ohio

Mr. Gary J. Yarus
Government Intern
17600 South Park
Shaker Heights, Ohio 44120

Mr. James C. Haube
Chief Chemist
City of Toledo
Bay View Park
Toledo, Ohio 43611

PROCEEDINGS

MR. STEIN: The conference is open.

We are expecting Assistant Secretary Carl L. Klein who is flying in from Washington this morning, and we just checked -- we were waiting for him to start the meeting, but his airplane is delayed in leaving Washington. There are no slowdowns, and it is due to get into Cleveland at 9:24, so we don't estimate that he will arrive here until 10:00. In view of the commitments that the other conferees and some of you may have, and the length of this meeting, we will start now and try to get some of the statements in the record and get the meeting started, and as soon as Secretary Klein comes in, we will turn the meeting over to him. He may have some opening remarks when he comes.

I would like to indicate to you, at this time, what the purpose of the meeting here is. We have had several Federal-State conferences in the matter of pollution of Lake Erie. We have come to some significant determinations among the States and the Federal Government. I think we do have a remedial program under way agreed upon by all the official agencies concerned, and this meeting today is to evaluate progress which is being made toward accomplishing these ends.

The proposed agenda is opening remarks by the Chairman -- and Mr. Klein should be here soon -- then we will have detailed reports on abatement of pollution from municipalities, the State and Federal installations, discussion of those that are behind schedule and what action is being taken, and we will call on the States. We will have detailed reports on removal of total phosphorus from waste discharges to Lake Erie by municipalities, industries, and Federal installations. We will call on all of the States and the Federal Government for a statement on this.

I think this is one area where the conference conclusions perhaps are not abundantly clear to all people concerned. I think we are generally agreed that phosphorus must be removed. There is a real question of the date when this should be accomplished.

We will have a report on surveillance of Lake Erie by the Federal Water Pollution Control Administration. We will have a committee report on a model for Lake Erie, which was established at an earlier session of the conference. After we have that we will have a committee report on Watercraft Waste Disposal. We established a working group on that under the leadership of Mr. Oeming in Michigan, whose place is now taken by Mr. Purdy. Then, we will have closing remarks.

I think in view of the large group up here, rather than my making all the introductions, let's start with Mr. Eagle. The conferees will introduce themselves. George, do you want to start?

MR. EAGLE: George Eagle, Ohio.

MR. POOLE: I am Blucher Poole of Indiana, and on my left is Perry Miller, who is largely my brains.

MR. POSTON: H. W. Poston, the Federal Water Pollution Control Administration, Great Lakes Regional office.

MR. LYON: Walter Lyon from Pennsylvania.

MR. PURDY: Ralph Purdy, Michigan.

MR. METZLER: Dwight Metzler from New York.

MR. STEIN: And I am Murray Stein from the U.S. Department of the Interior.

We have a statement from Congressman Richard McCarthy of New York, who has asked his statement to be read into the record. I believe Frank Hall has that statement.

Would you want to read that statement, Mr. Hall?

MR. HALL: This is the statement of Congressman Richard D. McCarthy to the Lake Erie Water Pollution Enforcement Conference, Cleveland, Ohio, June 27, 1969.

Hon. R. D. McCarthy

STATEMENT OF REPRESENTATIVE RICHARD D. McCARTHY, 39th CONGRESSIONAL DISTRICT OF THE STATE OF NEW YORK, AS READ BY FRANK HALL

MR. HALL: We meet today to measure the progress of our efforts to clean up pollution in Lake Erie. Four years ago this June in Buffalo, New York, the late Senator Robert F. Kennedy spoke to a meeting of the Senate Subcommittee on Air and Water Pollution. He said at that time that we could not afford to ignore the problem of the pollution of Lake Erie. He pointed to the following signs of the decay of the lake:

The city of Buffalo has had to warn its citizens not to drink municipal water without boiling because of a blockage of the intake valve during the winter.

Citizens of Wanakah have had to purchase drinking water because of the foul taste and smell of water drawn from the lake, probably caused by phenol and industrial wastes.

Beaches along Lake Erie have been contaminated to the point where they may no longer be used for swimming.

The nitrogen in wastes flowing into Lake Erie has caused algae to grow in inshore waters and pile up on the beach in quantities requiring removal every week by trucks.

The freshwater fishing industry in Lake Erie has been greatly reduced both in specie and quantity.

During rainstorms, the city of Buffalo discharges about one-third of the annual volume of 36 million pounds of suspended solids into Lake Erie because of the lack of holding pens or separate storm runoff and sewage drains.

At that subcommittee meeting, Senator Robert Kennedy urged that a Federal Water Pollution Enforcement Conference be held for Lake Erie so that a thorough study of pollution in the lake could be made.

On August 10, 1965, late Senator Kennedy and I welcomed representatives from the Lake Erie States to the Buffalo session of the Federal Enforcement Conference that had been called by Secretary Udall. At that time, Senator Kennedy pointed to the difficulty in getting some of the States and communities to enforce regulations against pollution. He also endorsed the recommendations of the conference that communities build secondary sewage treatment facilities and that storm sewers and sewage collection sewers be separated or so constructed that untreated wastes were not dumped into the lake. And Senator Kennedy called for Federal money -- enough money -- to help local communities build the needed equipment.

Now we meet four years later, and every citizen has the right to ask, "What have we accomplished?" for unless we are honest in measuring our success, or our failure, we will not know the size of the job that remains to be done.

I submit that although there have been some significant steps taken to clean up, we are losing the battle to save this vital resource. The following warnings indicate our lack of progress:

Although it has recently been estimated that it will cost $1.4 billion to clean up Lake Erie, the Federal Government has contributed only $9.7 million in the last five years towards the construction of waste treatment plants -- at best a token contribution to a large and critical need.

Although the lake States that joined in the original cleanup agreement adopted regulations forbidding the dumping of wastes in the lake, we find many exemptions being granted to these regulations.

A Federal report released last October states that nearly one-fourth of the lake is seriously short of oxygen, caused primarily by insufficiently treated sewage from lake cities and some industrial wastes.

As only one example, Buffalo, New York, has only been able to build three out of a needed twenty storm drains.

It has built these storm drains with its own money. It has been turned down three times by the Federal Government in its request for a $750,000 grant to help in this construction.

Measured against the need for action, the response has been inadequate. States have issued enforcement orders to cities -- enforcement orders that often go unmet because the cities cannot afford to comply. States issue anti-pollution regulations, and then consistently grant exemptions to those industries that request them. One State, New York, is apparently going to grant permits for gas and oil drillings in the lake bottom that do not incorporate the strict controls that the Department of Interior believes necessary in the Santa Barbara channel, a body of water that is not used for drinking purposes by millions of people. And the Federal Government has defaulted on its promise of assistance at a time when cities and towns are faced with increasingly heavy demands on their tax moneys.

To take a few specific examples of our poor record, major exemptions have been granted to industries to allow them to continue to pollute the lake. On January 22, 1969, New York State held a hearing on a request from Bethlehem Steel Lackawanna plant to allow them to continue dumping slag on 80 acres of Lake Erie bottom, a practice that had been prohibited in the regulations adopted by an earlier session of this Enforcement Conference. I made a statement to the hearing opposing extension of this dumping permit especially in view of the fact that the original permit stated that Bethlehem would find alternative methods of disposing of the slag in the year they were first allowed to continue dumping.

The Bethlehem Steel permit is a test case because this company is one of the largest industries on the lake. It recorded an annual profit of $160 million in 1968. It is a healthy industry. It should set an example for the other industries along the lake. It does not suffer the problems of the small, marginal company that may have great difficulty in meeting the expenses of pollution control. In addition, there are many economic ways to dispose of slag. By lowering the sales price of this by-product, more local communities may use it for road fill. It can also be used for land fill or disposed of in abandoned mine shafts. Other steel companies along the lake generally do not dump slag in the manner requested by Bethlehem.

On February 3, 1969, because of my concern about the proposed slag dumping permit extension, I requested Governor Rockefeller to personally intervene in this case to ensure that New York State lived up to its obligations under the Lake Erie Water Pollution agreement. Yet on March 6, 1969, New York State agreed to extend the Bethlehem slag dumping permit for two years. It took this action despite the requirements or intent of the Lake Erie Conference, the Lake Erie Report, "A Plan for Water Pollution Control, USDI, FWPCA, August 1968," The Water Quality Act of 1965, and a reaffirmation of opposition to the proposed permit by Commissioner Moore of the FWPCA.

Following Governor Rockefeller's action in permitting the continued pollution of Lake Erie, I called on Secretary Hickel to consider the problem of permit exemptions at the next session of the Lake Erie Conference. I asked that the Bethlehem permit extension be considered as well as the practice followed by most of the Great Lake States in granting exemptions from the anti-pollution regulations. Congressman Vanik, for example, recently testified before the Rivers and Harbors Subcommittee that Ohio alone has granted one thousand exemptions from their water pollution regulations. This is about the same number of exemptions that Ohio granted five years ago.

Second, in another area, States, cities and towns have made efforts to meet the costs of building new sewage treatment plants. New York State passed a $1.6 billion pure water bond issue for this purpose. Cleveland, Ohio passed a $100 million bond issue. And a number of small communities where the cost of building really pinches -- for their citizens are often on fixed income and there is no industrial tax base -- have passed clean water bond issues to meet the demands of State agencies that they provide treatment plants.

Yet although the Enforcement Conference has emphasized the need to build secondary treatment plants for all municipal wastes -- a process that removes 65 percent of the contaminants -- many cities have been unable to do so. Buffalo is a typical example. It is an older city with combined storm and sewage drains. This results in the discharge of much of the contaminants during the spring runoff. Buffalo has been ordered to separate its storm drains from its sewage drains. Yet it cannot meet the costs. They have built three storm drains from city money. Yet they need 20 of these storm drains. Buffalo requested $750,000 from the Federal Government for its storm drains. It has been turned down three times. Buffalo must build a $75 million system. It must pay 40 percent of the cost of this system, $30 million. Ironically, Buffalo has a total legal borrowing authority of $30 million.

Third, the Federal Government has failed to obey either its own regulations against pollution, or to meet its promises of financial assistance, and now the Department of Interior has begun to call for tertiary treatment -- a process that removes about 90 percent of the contaminants -- by Lake Erie's cities and towns.

The Federal Government continues to violate the regulations against pollution. The Corps of Engineers informed Lake Erie communities that it would continue dumping dredgings that contain heavy pollutants such as oils and acids in Lake Erie. Although the Corps has temporarily stopped dumping some of the most polluted dredgings in the lake by placing them in specially constructed diked areas, the funds for this work are running out and the Corps says that it will have to place these dredgings in the open lake. It plans to do this despite the specific language of Executive Order 11288 which states that each Federal agency will do all that it can to prevent the pollution of our lakes and rivers.

The Federal Government has also failed to honor its promises of funds. Although Congress authorized $4.2 billion for water pollution control in the last six years, only $1.6 billion has been appropriated leaving a gap of

$2.6 billion. Although Congress has authorized $1.1 billion for the construction of control facilities in 1970, the Executive Branch has only sent a budget of $214 million to Congress. This means that States and cities have not received the Federal share of the costs of the Lake Erie cleanup. And it means that they will not receive the required money this year. New York State, for example, has paid 99 percent of the Federal share of the costs of its water pollution control program, and it apparently will not be repaid.

I for one believe that our national priorities are sadly out of whack when we cannot bring ourselves to meet the costs of even one-fifth of a minimum water cleanup program.

For example: The Air Force's C-5A Cargo Plane over-run is $1.36 billion -- the same amount of money that we are told is needed to clean up Lake Erie.

Nine Defense Department projects' cost totaled about $4 billion above first estimates. This money would have met the total cost of our national water pollution control program the last six years.

The budget for chemical and biological warfare activities, a marginal requirement, is estimated at a minimum of $350 million as contrasted with $214 million for water pollution control.

The estimated cost of the so-called safe-guard anti-ballistic missile system is $10 billion -- enough to clean up Lake Erie four times over.

The gasoline tax devoted exclusively to the Federal Interstate highway system will provide about $1 billion to the States in 1970, the amount authorized for water pollution control by Congress.

It would indeed be a tragedy if we carelessly spent billions of dollars in the defense field only to discover that in the meantime we have destroyed through neglect our Nation's natural assets.

I, therefore, urge the various Government agencies and executives to undertake the following steps to save Lake Erie:

State Water Pollution Control Agencies should strictly enforce the anti-pollution regulations that have been adopted by the Conference and by each State.

Federal departments and agencies should follow strictly Executive Order 11288. I ask Secretary Hickel to take the lead in ensuring that the Corps of Engineers does not dump polluted dredgings in the lake. I also ask him to take the lead in seeing that the Corps does not issue a permit approving the Bethlehem Steel slag dumping request.

I urge President Nixon to submit a water pollution control budget for 1970 that fully meets the amount authorized by Congress.

In the event that the Administration does not request the necessary funds, I will urge the Congress to appropriate the full $1.1 billion originally authorized.

Those who follow will judge us by what we accomplish now. They will judge us by what we did to preserve or defile our great national assets. We know that we can. The only question now is whether we will act. And if we do, whether it will be in time to save our rich natural heritage.

That is the conclusion of the statement of Congressman Richard D. McCarthy.

MR. STEIN: Thank you.

MR. HALL: Mr. Stein, I will have this reproduced and presented to the Conferees.

MR. STEIN: Any comments or questions?

MR. METZLER: I don't think so. The Congressman has been an effective advocate of pure water, clean water, and we are glad to have him from New York State.

MR. STEIN: So am I.

MR. METZLER: We endorse his support of added Federal funding as well as adequate State and local action.

MR. STEIN: He has been interested in water pollution ever since he got into the Congress and before that. He raised one question in that statement that I think we are going to have to possibly meet for the record. I am not sure that the slag problem he talks about is in Lake Erie. Is that correct?

FROM THE FLOOR: Yes, it is in Lake Erie.

MR. STEIN: It is in Lake Erie. Thanks. That answers the question. Thank you.

Now -- I am sorry -- I should have given you the rules of the conference. Unless you are going to make a statement and you have a question, we do not take questions or comments from the floor. You can, if you wish, register with your State representative, or the Chairman, and we will put you on the program. The reason for this is that if we permitted comments from the floor, we probably would have to take a long-term lease on this little room because we wouldn't get out. So we ask you to comply with these rules.

Are there any other congressional representatives in the room at this time who wish to make statements?

If not, let's see if we can proceed and go along with the Indiana statement on progress being made.

Here we are. Secretary Klein has arrived, at the present time.

OPENING STATEMENT OF THE HONORABLE CARL L. KLEIN, ASSISTANT SECRETARY OF THE INTERIOR FOR WATER QUALITY AND RESEARCH

MR. KLEIN: Thank you very much, Murray.

MR. STEIN: Thank you.

MR. KLEIN: Good morning Conferees, ladies, and gentlemen. The meeting is now open.

This meeting for the conference in the matter of pollution of Lake Erie and its tributaries in the States of Michigan, Indiana, Ohio, Pennsylvania, and New York is being held under the provisions of Section 10 of the Federal Water Pollution Control Act, as amended.

In 1965, in accordance with a request from James A. Rhodes, Governor of Ohio, and on the basis of reports, surveys or studies, the first session of this conference was initiated. It was held on August 3-5, 1965. The second session of the conference was held on August 10-12, 1965. The third session was held March 22, 1967, and the fourth session took place on October 4, 1968. The previous progress meetings for this conference were held in 1966 and 1968.

Both the State and Federal Governments have responsibilities in dealing with water pollution control problems. The Federal Water Pollution Control Act declares that the States have primary rights and responsibilities for taking action to abate and control pollution. Consistent with this, we are charged by law to encourage the States in these activities.

At the same time, the Secretary of the Interior is charged by law with specific responsibilities in the field of water pollution control in connection with pollution of interstate and navigable waters. The Federal Water Pollution Control Act provides that pollution of interstate or navigable waters which endangers the health or welfare of any persons, shall be subject to abatement. This applies whether the matter causing or contributing to the pollution is discharged directly into such waters or reaches such waters after discharge into a tributary.

The purpose of this meeting is to bring together the State water pollution control agencies, representatives of the U. S. Department of the Interior, and other interested parties to review the existing situation and the progress which has been made to comply with the conference recommendations, and to receive the reports of the technical committees that were established by the conference.

The Michigan Water Resources Commission will be represented by Ralph Purdy; the Indiana Stream Pollution Control Board will be represented by Blucher Poole; the Ohio Water Pollution Control Board will be represented by George Eagle; the Pennsylvania Department of Health will be represented by Walter Lyon; and the representative of the New York State Department of Health is Dwight Metzler.

Mr. H. W. Poston is the Federal Conferee and he is Director for this region of the Federal Water Pollution Control Administration, U. S. Department of the Interior, with headquarters in Chicago.

My name is Carl L. Klein, Assistant Secretary of the Interior for Water Quality and Research. After my opening remarks, Mr. Murray Stein, Assistant Commissioner for Enforcement, Federal Water Pollution Control Administration in Washington, D.C., will act as the Chairman of the proceedings in his role as the representative of Secretary Hickel to this conference.

The parties to this meeting are the official State water pollution control agencies of Michigan, Indiana, Ohio, Pennsylvania, and New York, and the U. S. Department of the Interior. Participation in this meeting will be open to representatives and invitees of these agencies, and such persons as inform me that they wish to make statements.

A record and verbatim transcript of the meeting is being made for the purpose of aiding us in preparing a summary and also for providing complete record of what is said here.

Copies of the summary and transcript of this meeting will be made available to the official State water pollution control agencies. We have generally found that for the purpose of maintaining relationships within the States, the people who wish summaries and transcripts should request them through their State agency rather than come directly to the Federal Government. The reason for this is that, when the conference has been concluded, we would prefer people who are interested in the problem to follow their normal relations in dealing with the State agencies rather than the Federal Government.

In concluding my opening remarks, let me address myself to the fact that many people have referred to Lake Erie as a "dying Lake."

I want to state, simply, that Lake Erie is not dead yet. We can restore it, and we want to restore it, and this Administration is committed to that end.

As you know, President Nixon has assigned a top priority to environmental quality, and has placed heavy emphasis on cleaning up water pollution The Environmental Quality Council is one of only three Cabinet Councils the President has established, and he has placed heavy responsibility for the success of the Council's mission on my superior, Secretary Hickel.

In turn, Secretary Hickel has given us definite instructions to use all possible and attainable means to find solutions to our pollution problems, and to bring such solutions into being forthwith.

I can assure you that the Secretary is not without power when pollution abatement does not take place on interstate waters.

Under the law, he can call a public hearing if reasonable progress to abate pollution is not being taken. Then, if necessary, he can turn the matter over to the Attorney General for court action.

Please rest assured that the Secretary intends to enforce the law and take such recourse, if necessary.

Now, a final word about the international situation in the case at hand. It goes without saying that cooperation between Canada and the United States is an obviously essential ingredient in the task of restoring Lake Erie to its rightful place and condition.

The International Joint Commission has an important coordinating role to play with respect to the water levels of Lake Erie and Lake Ontario, and with respect to Lake Superior, and with respect to water quality in the connecting channels.

I am encouraged that there is already an effective liaison between the two countries at working levels. This is useful and constructive, and there is no doubt that this kind of cooperation should and will continue and grow.

I will depart from my written text, at this time.

Somebody gave me an idea on the plane on the way over, and that is that the sewage treatment plant construction is only five percent of the total cost of handling water in a domestic cycle, and it is the last five percent. The water cycle begins with a costly intake. We go through a water purification and a water distribution cycle, and very often these are at great expense, and as our wastes get polluted, the water purification becomes more and more costly.

Then, we have the expensive household plumbing fixtures -- many of them fancy, many of them colored. Then, we go into the sewers and the interceptors, and at the last part of it, we have the sewage treatment plant that can put the water back into shape.

At the Washington Enforcement Conference -- I don't know whether you are aware of this, but early this year, we arrived at the proposition that we are going to put practically drinking water back into the Potomac River. We are going to have 96 percent removal of both suspended solids and dissolved solids, and 85 percent removal of phosphate and nitrates, and it is going to be done.

If the last five percent is sewage treatment plant construction, and we don't meet the problem there, we will be paying that five percent at the water purification level. It has to come about one place or the other, and we should do it at the sewage treatment plant construction so that we have usable water thereafter.

I would suggest that all speakers and participants other than Conferees making statements come to the lectern and identify themselves for purposes of the record as we go forward.

Thank you. (Applause)

MR. STEIN: We will now call on Indiana for its report. Mr. Poole.

Perry Miller

MR. POOLE: Mr. Chairman, Perry Miller will present the Indiana report.

MR. STEIN: Yes. Thank you very much, Mr. Poole. Mr. Miller.

STATEMENT OF PERRY MILLER, DIRECTOR,
BUREAU OF ENGINEERING, INDIANA STATE
BOARD OF HEALTH, INDIANAPOLIS, INDIANA

MR. MILLER: Mr. Chairman, Conferees, ladies and gentlemen, my name is Perry Miller. I am Director of the Bureau of Engineering, the Indiana State Board of Health, and I am here making this statement on behalf of the Indiana Stream Pollution Control Board.

I would ask, Mr. Chairman, that the report be included in the record as read. I will here attempt to summarize it.

MR. STEIN: Without objection, that will be done.

MR. MILLER: All Indiana municipalities in the Lake Erie Basin, with recognized sewer systems, have secondary-type treatment facilities. Increased surveillance of plant operation by representatives of the Stream Pollution Control Board has resulted in better operation

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and maintenance, increased laboratory analyses, and more meaningful monthly operation reports. In compliance with Indiana's Mandatory Certification Act, all municipal wastewater treatment facilities in the basin have a certified operator in responsible charge of the facilities.

The Maumee River plant operated by Diversified Utilities, a private utility, is designed for a flow of 0.5 mgd; however, it is now receiving flows of 0.75 to 0.8 mgd. The utility signed an agreement with the city of Fort Wayne for diversion of sewage flow above plant capacity to the Fort Wayne sewer system and plans have been prepared for this connection. However, as the utility is undergoing reorganization under the Bankruptcy Act, financing of the project has been delayed. It appears that developers in the area will contribute to the cost of the project and that construction will be undertaken later this year.

The city of Fort Wayne is continuing the planning of major improvements to its combined sewer system to provide separation and/or treatment of combined sewer overflows. A master plan for such improvements was considered satisfactory by the Board in May 1969. Construction of sewer improvements will proceed as financing is available. The city has submitted final plans for

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effluent chlorination facilities and for detention ponds to reduce the amount of bypassed or partially treated sewage discharged directly to the receiving stream. The discharge of waste lime sludge from the water treatment plant to the river has been discontinued.

Butler and Decatur have filed plans for major plant improvements. These will be revised to include phosphorus removal facilities prior to construction. Avilla, Berne, Butler, Decatur, and Fort Wayne have filed applications for State and Federal grants to help finance proposed sewage works projects. The shortage of Federal grants to fund needed projects is seriously affecting projected time schedules for compliance with Water Quality Standards.

Effluent Chlorination

The municipalities of Auburn, Garrett, Waterloo, and Monroeville are providing effluent chlorination and Decatur should have facilities in operation within the next few weeks. Diversified Utilities also provides effluent chlorination. The town of Avilla has advised it plans to construct approved facilities with its own forces. Butler, Fort Wayne, and New Haven plan to provide effluent chlorination facilities in connection with projects for major plant improvements. Berne is planning

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effluent chlorination facilities which may be included in a phosphorus removal project.

Phosphate Removal

All municipalities in the basin, with a population over 2,000, were advised by letters in May 1969, of the requirement for at least 80 percent phosphorus reduction by December 1972. The New Haven project, which is expected to go to construction by August 1969, includes facilities for phosphorus removal. No projects for major plant improvements will be approved unless phosphorus removal facilities are included. Construction is underway on portions of the project for pilot plant studies on phosphorus removal by the city of Fort Wayne. This project is supported by a $283,200 Federal grant.

Industrial

Of the 22 industries in the basin, 17 have adequate waste control facilities, and five need additional treatment works. One of the 17 with adequate facilities, Auburn Tankage Company, has closed. Of the five industries needing additional treatment, four have treatment or control facilities under construction. Kitchen-Quip, Inc., is the only industry that has not developed a pollution control program.

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A list of the 17 adequate industries is as follows:

1. Salisbury Division, Dana Corporation, Fort Wayne
2. Essex Wire Corporation, Fort Wayne
3. Gladieux Refinery, Inc., Fort Wayne
4. I.T.T. Industrial Laboratories, Fort Wayne
5. Magnavox Company, Fort Wayne
6. Phelps Dodge Copper Products Corporation, Indiana Rod and Wire Division, Fort Wayne
7. Zollner Corporation, Fort Wayne
8. B. F. Goodrich Company, Fort Wayne
9. Shaw's Dressed Poultry, Grabill
10. Crane Edmund Corporation, Butler
11. Universal Tool and Stamping Company, Butler
12. T. H. Products Corporation, Waterloo

*13. Auburn Tankage Company, Auburn

14. County Line Cheese Company, Auburn
15. Warner Motive Division, Borg-Warner Corporation, Auburn
16. Ralph Sechler and Sons, Inc., St. Joe
17. Central Soya Company, Inc., Decatur

*Plant closed in 1969

A status report of the seven industries listed as inadequate at the last status report in December 1968, is as follows:

Franke Plating Works, Inc., Fort Wayne

Construction on cyanide and chromium wastewater treatment facilities approved by the Board on October 15, 1968, was started during March 1969. Completion of the proposed facilities is predicted by October 1969. If continued progress is not made, the Board will initiate legal action.

General Plating and Engineering Company, Inc., Fort Wayne

Construction on cyanide and chromium wastewater treatment facilities was started during the fall of 1968. Progress on construction has been slow because the owner is revising the plating operation and also because the owner is doing a large part of the installation of equipment. The industry states that the waste treatment facilities will be completed early in the fall of 1969. The Board will initiate legal action unless better progress is made on completion of construction.

International Harvester Company, Fort Wayne

All contaminated wastewater from the plant was connected to the Fort Wayne sewerage system with the exception of the sewage from the southeast area of the plant. This wastewater is to be intercepted by a sewer which is under construction by a sewer utility for discharge to the Fort Wayne sewerage system. The industry states that the sewer should be completed during November of 1969. This sewer project is a part of the sewer work being done by the same sewer utility that is constructing the sewer to serve Parrot Packing Company. Because of the delay in start of construction, the listed completion date may not be met.

Parrot Packing Company, Fort Wayne

Construction was restarted during March 1969, by a sewer utility on the sewer that will convey the wastewater to the Fort Wayne sewerage system. Slow progress has been made but completion of the project is anticipated within 30 days. This project was delayed during the spring of 1968 because of a court action filed by a property owner concerning connection charges and delayed again during late 1968 and early 1969 because of financial difficulty encountered by the sewer utility.

Crane Edmund Corporation, Butler

This industry was providing adequate waste control until 1968 when a problem was encountered with the disposal of cyanide-bearing heat-treat quench water and oily wastewater. Enforcement action was scheduled by

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the Board and a stipulation agreed to on November 13, 1968, that adequate wastewater treatment facilities would be installed within 120 days. The industry has completed facilities to collect the cyanide-bearing wastewater for disposal through a chemical disposal company and facilities to separate oil from the wastewater. Effluent analyses show that adequate waste control is being provided.

Universal Tool and Stamping Company, Butler

Enforcement action was scheduled by the Board and a stipulation agreed to on August 21, 1968, to the effect that adequate wastewater treatment facilities would be installed within 180 days. The industry has converted to a non-cyanide zinc plating bath to eliminate the use of cyanide, isolated the use of soluble oils, and converted an existing underground tank into an oil separator. Effluent analyses show that adequate waste control is being provided. The Company is planning the construction of a polishing lagoon for the total effluent.

Kitchen-Quip, Inc., Waterloo

A cease and desist order was issued by the Board on June 18, 1968. The order provided that waste treatment facilities must be completed by December 31, 1968. The industry filed for judicial review after receiving the order, and on January 10, 1969, the LaGrange County Circuit Court Judge decreed that the order be set aside and held for naught, and remanded this back to the Stream Pollution Control Board for further action. The Board is conducting surveys and expects to institute legal action again in the near future on this case.

Legislation, 1969 Indiana General Assembly

The following digest of Acts passed by the 1969 Indiana General Assembly have a bearing on water pollution control activities:

1. Biennial Operating Budget (Chapter 397, Acts of 1969) (H. 1091)

Appropriations for the operation of State government in the 1969-71 biennium. Includes an appropriation of $3 million for fiscal 1970 and $3.5 million for fiscal 1971, with authorization for the State to make grants to municipalities to assist them in financing the construction of those portions of water pollution control projects which qualify for Federal aid. The State's contribution shall not exceed 25 percent of the eligible cost of each project. Emergency. Approved March 15, 1969.

2. Control of Pollution from Boats (Chapter 71, Acts of 1969)(H. 1077)

Amends Boating Law of 1957. Removes the exemption of Lake Michigan regarding the prohibition of discharge of sewage from boats. Provides for the use of holding tanks, incinerators or treatment systems which are approved by the Stream Pollution Control Board. Effective January 1, 1971. Approved March 7, 1969.

3. Litter Control Law (Chapter 66, Acts of 1969) (H. 1079)

Makes it unlawful to dispose of refuse within the limits of or adjacent to any public highway, State park, or recreation area, or in or adjacent to any lake or stream. Provides for enforcement by peace officers and conservation officers of the Department of Natural Resources. Repeals Chapter 94, Acts of 1953. Effective April 1, 1969. Approved March 7, 1969.

Conclusions

1. The Stream Pollution Control Board has continued efforts to comply with recommendations of the Conferees.

2. All Indiana municipalities with recognized sewer systems have secondary treatement works in operation. The need for plant improvements has been recognized by Avilla, Berne, Butler, Decatur, Diversified Utilities, Fort Wayne, and New Haven. Plans for these improvements

have been filed or are in preparation; however, the lack of adequate Federal construction grant funds has seriously delayed construction schedules. I might say these are in the basin.

3. All Indiana municipalities with a population over 2,000 have been advised of the requirement for 80 percent phosphorus reduction by 1972. No projects for major improvement will be approved unless phosphorus removal facilities are included. Studies on phosphorus removal are underway at Fort Wayne, and New Haven is expected to start construction on major plant improvements which include facilities for phosphorus removal.

4. Legislation enacted by the 1969 General Assembly provides $6.5 million in State matching grants for fiscal years 1969-1970 and 1970-1971 for municipal projects receiving Federal grants, amends the Act concerning the operation of watercraft to include the Indiana waters of Lake Michigan, and provide control of the discharge of sewage and litter, and a litter control law.

5. All industries which are required to maintain effluent monitoring programs are maintaining such programs.

6. The Board initiated legal action against

Crane Edmund Corporation and Universal Tool and Stamping Company, Inc., Butler, and both industries stipulated to construct needed treatment and control work. The two industries have provided adequate control.

7. The Board issued a cease and desist order on June 17, 1968, to the Kitchen-Quip, Inc., Waterloo, that contained a compliance date of December 31, 1968; however, on January 13, 1969, the LaGrange County Circuit Court Judge ruled that the order was held for naught and set aside.

8. Seventeen of the 22 industrial plants provide adequate waste control facilities, four have facilities under construction, and one has not taken any action. One of the 17 industries listed as adequate has recently closed its operations.

9. The Board is continuing its stream monitoring and plant surveillance activities.

Thank you.

MR. STEIN: Thank you, Mr. Miller.

(The above-referred to tables follow.)

INDIANA

Name	Status			Changes of Schedules		
	Last Completed Phase	Date of Completion	Date of Approval	Phase that was Scheduled for Completion but has not yet been completed	Reason for Delay	Action Taken and/or Extension of Date
			MUNICIPALITIES			
Avilla	Plans for effluent chlorination	1968	1969	Construction of project.	**Financing problems	No change.
Berne (1)	Preliminary plans for effluent chlorination	1968	--	Final plans and construction.	**Financing problems	No change.
Butler (1)	Plans for plant improvement and effluent chlorination	1968	1968	Construction of project.	**Financing problems	No change.
Decatur (1)	Preliminary plans for plant improvements	1968	--	Final plans for improvements. Repair and operation of chlorination facilities.	**City planned to complete with plant improvements.	No change.
Diversified Utilities (1)	Plans for connection of existing sewage flow to Fort Wayne	1969	1969	Construction of lift station and force main gravity sewer connection.	Problems encountered in reorganization of utility.	Limiting sewer connections; construction expected 1969.
Fort Wayne (1)	Effluent chlorination	1968	--	Construction of effluent chlorination submitted as part of larger project.	**Financing problems	No change. Construction anticipated in 1969.
	Phosphorus removal pilot study	1969	1969	Construction of project	None	Project is about on schedule.
Garrett (1)	Repair and operation of existing chlorination	1968		--		--

INDIANA

Name	Status			Changes of Schedules		
	Last Completed Phase	Date of Completion	Date of Approval	Phase that was Scheduled for Completion but has not yet been completed	Reason for Delay	Action Taken and/or Extension of Date
				MUNICIPALITIES		
New Haven (1)	Plans for plant improvement includes phosphorus removal	1969	1969	Construction of project.	Delayed for revision of plans to include phosphorus removal.	Construction anticipated by August, 1969. State & Federal grant available.
Waterloo	Construction of effluent chlorination facilities	1968	1967	--	--	--
Auburn (1)	Plant improvements including effluent chlorination	1966	--	--	--	--
Monroeville	Plant improvements including effluent chlorination	1964	--	--	--	--

(1) Phosphorus removal required by the end of 1972.

** Municipalities have applications for State and Federal grants on file.

INDIANA

Name	Status			Changes of Schedules		
	Last Completed Phase	Date of Completion	Date of Approval	Phase that was Scheduled for Completion but has not yet been completed	Reason for Delay	Action Taken and/or Extension of Date
[illegible] Plating (Fort Wayne)			10/15/68		Late start by contractor	Under construction. Completion listed for October, 1969
Central Plating and Engineering, Inc. (Fort Wayne)			12/19/67		Late start of construction	Under construction. Completion listed for fall of 1969
International Harvester Company (Fort Wayne)			--		Delay of starting construction by sewer utility because of financial difficulty	Construction re-started. Completion listed for fall of 1969
Kitchen-Quip, Inc. (Waterloo)			--		Unfavorable court decision and un-cooperative industry	No action by Company. Court set aside the Board's Order of 6/18/69. New enforcement action being pre-pared
Parrot Packing Co. (Fort Wayne			--		Delay of construc-tion by sewer utility because of court action and delay in restarting construction because of financial problems	Construction re-started. Completion listed for August 1, 1969

INDIANA

Name	Status			Changes of Schedules		
	Last Completed Phase	Date of Completion	Date of Approval	Phase that was Scheduled for Completion but has not yet been completed	Reason for Delay	Action Taken and/or Extension of Date
Universal Tool and Stamping Company (Butler)	Completed and adequate control being provided					
[illegible] Corp. (Butler)	Completed and adequate control being provided					
Warner-Automotive Div. Borg-Warner Corp. (Auburn)	Adequate control continues					
Auburn [illegible] Co. (Auburn)	Plant closed in 19[illegible]9					
Central Soya Co., Inc. (Decatur)	Adequate control continues					
County Line Cheese Co. (Auburn)	Adequate control continues					
[illegible] Corp. (Fort Wayne)	Adequate control continues					
[illegible], Inc. (Fort Wayne)	Adequate control continues					

Name	Status			Changes of Schedules		
	Last Completed Phase	Date of Completion	Date of Approval	Phase that was Scheduled for Completion but has not yet been completed	Reason for Delay	Action Taken and/or Extension of Date
B. F. Goodrich Co. (Woodburn)	Adequate control continues					
I T & T Federal Laboratories (Fort Wayne)	Adequate control continues					
Magnavox Company (Fort Wayne)	Adequate control continues					
Phelps Dodge Copper Products [illegible] and Wire Division (Fort Wayne)	Adequate control continues					
R. [illegible] & Sons, Inc. ([illegible])	Adequate control continues					
[illegible] Foundry ([illegible])	Adequate control continues					
T. [illegible] Corp. ([illegible])	Adequate control continues					
Zollner Corp. (Fort Wayne)	Adequate control continues					

MR. STEIN: Are there any comments or questions?

MR. PURDY: Mr. Miller, since Indiana is now participating in 25 percent of the grant cost, or the project cost, does that now mean that they are receiving 50 percent Federal grants on their projects?

MR. MILLER: Yes, they would receive 50 percent Federal grants on their projects and 25 percent State grant from the State for their projects.

MR. PURDY: Roughly, what is the amount of Federal money that Indiana receives?

MR. MILLER: Indiana received slightly over $5 million last year, and it would be anticipated that this would be the amount we would receive on the proposed budget that has been submitted to Congress.

MR. PURDY: So this would mean that your construction in Indiana is limited to about $10 million a year unless a municipality is willing to go ahead without a grant?

MR. MILLER: This is right. And I might say at this point that we have this year received 135 applications for Federal grants, and the Federal dollars requested are $45 million. So that you can see that the $5 million is only a small fraction of that which is needed for the applications that we now have on file.

MR. POOLE: It runs better than $10 million. That is the estimated cost of these 135 applications that are eligible for $45 million in Federal funds is between

$125 and $130 million. It brings in some of the ineligible portions.

MR. PURDY: Yes, but for treatment works that are an eligible part of the works, they are limited to roughly $10 million worth of construction unless somebody is willing to go ahead without a 75 percent grant.

MR. POOLE: We have a few. I think we have eight or nine that have gone ahead in the last couple of years.

MR. PURDY: But this would be on the basis of the reimbursement provisions that are now in the Act, is that correct?

MR. POOLE: That is right.

MR. STEIN: Are there any further comments or questions?

I have one question, Mr. Miller: What was the basis of the Court's setting aside the Order against Kitchen-Quip?

MR. MILLER: The Judge indicated that the Order was not definitive enough, and what we really have to do is go back, in my opinion, and give him some effluent quality that he has to meet in the stream, and we had not done this, and since that time, he has changed some of his operations, so we are forced to go back in and resurvey the stream to obtain new evidence from which to initiate another hearing.

MR. POOLE: Incidentally, Mr. Stein, this is the first case we have lost in 20 years.

MR. STEIN: I know that; that is why I was surprised! Indiana has one of the best enforcement and compliance batting averages of anyone, and that includes the Federal Government. Are there any comments or questions? If not, thank you very much, Mr. Miller.

May we hear from Michigan, and I would like to point out, before we go on to Michigan, that each State will manage its own time. If you have any participants, this is the time to call them. Is Indiana all concluded?

MR. POOLE: Yes.

MR. STEIN: May we call on Michigan? Mr. Purdy.

MR. PURDY: Yes. I would like to call on Mr. Frost to present the State report.

STATEMENT OF F. B. FROST, CHIEF ENGINEER, MICHIGAN WATER RESOURCES COMMISSION, LANSING, MICHIGAN

MR. FROST: Ladies and gentlemen, I will brief Michigan's report, Mr. Chairman, but I would ask that it be entered into the record in its entirety.

MR. STEIN: Without objection, that will be done.

MR. FROST: At the reconvened conferences in Cleveland in 1966, in Buffalo in 1967, and again in Cleveland in 1968, the Michigan Water Resources Commission reviewed the pollution control program that had been developed to abate pollution and enhance the Michigan waters of Lake Erie and its tributaries. The reports outlined how Michigan, in 1965, had established water quality goals for the Detroit River and Michigan waters of Lake Erie and how a voluntary pollution abatement program had been formed with the cooperation of industries and municipalities. The reports further set down the effluent restrictions and treatment facility construction time schedules required to achieve the desired water quality goals. Finally, the reports described the water quality, surveillance, and effluent monitoring programs that have been established by the Michigan Water Resources Commission.

This report reviews the compliance status of the previously approved abatement programs and time schedules and presents information on recent pollution control activities affecting water quality in Michigan's waters of Lake Erie.

Industrial and Municipal Compliance Status

Appendix A lists the current performance status of the 25 industrial plants and 12 municipal units who have stipulations with the Michigan Water Resources Commission to control their waste discharges to the Detroit

River and Lake Erie. The following table summarizes results to date:

Five municipalities are on original schedule and in compliance. One is on modified schedule and in compliance.

Five are not in compliance with Commission action taken or pending. One is not in compliance, with legal action taken.

There is a correction in the report. Sixteen industries are on original schedule and in compliance. Ten are on modified schedule and in compliance.

Appendix B lists the Michigan industries and municipalities which have discharges in Michigan's portion of the Lake Erie-Detroit River Basin and indicates those which have nutrient discharges that affect Lake Erie water quality. There are essentially no industries who presently discharge nutrients to the Detroit River or Lake Erie without prior treatment or partial removal. There are 49 municipal units whose discharges may contain nutrients that affect Lake Erie water quality. Thirteen of the municipal units have programs under way to improve their treatment. In accordance with Michigan's approved interstate standards plan of implementation, all affected units of government will be expected to accomplish phosphorus removal by June 1, 1977.

F. B. Frost

I would add here, Mr. Chairman, phosphorus removal for completion by 1972 will care for approximately 80 percent of the total population of the basin.

Water Quality Standards

Since the 1968 reconvened conference, Michigan has adopted water quality standards and designated uses for its intrastate waters. This program plus the previously approved interstate standards program now provide standards for all of Michigan's waters. The one exception is temperature standards for fish, wildlife and other aquatic life for interstate waters. Public hearings to resolve the temperature standards are scheduled for the fall of 1969.

Construction Grant Program

Michigan has implemented a $285 million bonding program for construction of municipal wastewater treatment plants. The bonding money will enable communities to receive grants up to 55 percent of the cost of construction of treatment works. This is divided into a 25 percent outright State grant, a 25 percent State advance of anticipated future Federal funds, and an expected five percent Federal grant. An additional $50 million bond issue has been approved by Michigan voters for construction of collecting sewers and is awaiting enabling legislation.

F. B. Frost

Michigan has recognized its commitment by assisting its communities in financing needed treatment facilities and by advancing State bond moneys for anticipated Federal funds. It is requiring local units to provide the remaining funds with the guarantee that their advanced share will be reimbursed by future Federal moneys before the State receives reimbursement for its advanced moneys.

Water Quality Surveillance of the Michigan Waters of Lake Erie and Its Tributaries

The water quality surveillance program established by Michigan was described in detail to the Conferees at Buffalo in 1967. The sampling and testing of the Detroit River and Lake Erie at 63 locations is continuing, and the data obtained during 1966, 1967, and 1968 have been tabulated in Appendix C. Similar data for the 75 municipal and industrial waste discharges along the Detroit, Rouge, Huron, and Raisin Rivers is shown in Appendix D.

For a summary of the compliance status, as shown on page four, those industries that are in compliance on the original time schedule -- I will list them: Allied Chemical Corporation, Semet Solvay Division. Solvay Process Division; American Cement Corporation, Peerless Cement Division; E. I. duPont deNemours and Company, Inc., Industrial and Biochemical Division; Firestone Tire and Rubber Company; the Ford Motor Company, Monroe Plant; the Great Lakes Steel Corporation, 80" Hot Strip Mill; McLouth Steel Corporation; Mobil Oil Company; Monsanto Company, Trenton Plant; Pennwalt Chemicals Corporation, their East Plant and their West Plant.

In the second category, where there is a modified time schedule, and in compliance -- under here I would list the industries as: Consolidated Packaging Corporation, North Plant; Consolidated Packaging Corporation, South Plant; Time Container Corporation; Union Camp Corporation; the Wyandotte Chemicals Corporation, South Plant; Scott Paper Company; Monsanto Company, Trenton Resins Plant; and Darling and Company. Under the municipal units, Detroit.

In the category, "Not in Compliance," where Commission action has been taken or is pending, there are no industries in this category. For municipalities, I would list under here: Wayne County, Wyandotte Plant; Monroe City; Monroe Township; Berlin Township; Frenchtown Township. And in the category, "Not in Compliance, Legal Action Taken," no industries; and under municipalities, Berlin Township, Monroe County.

Water Management Bureau

Effective May 1, 1969, the staff of the Michigan Water Resources Commission was reorganized into a Water Management Bureau under the Michigan Department of Natural Resources. Formation of the Bureau consolidates many water management responsibilities into a single integrated unit with a Deputy Director at its head. The Deputy Director will continue to hold the title of Executive Secretary of the Water Resources Commission and the Water Resources Commission will continue in existence with the same membership it has had in the past. The reorganization has added submerged lands, lake engineering and oil pollution control functions to the new bureau.

This would complete Michigan's report, Mr. Chairman.

(The above-mentioned Michigan report follows.)

INDUSTRIAL AND MUNICIPAL COMPLIANCE STATUS

Appendix A lists the current performance status of the 25 industrial plants and 12 municipal units who have stipulations with the Michigan Water Resources Commission to control their waste discharges to the Detroit River and Lake Erie. The following table summarizes results to date:

	On original schedule and in Compliance	On Modified schedule and in Compliance	Not in compliance. Commission action taken or pending	Not in compliance. Legal action taken
Municipalities	5	1	5	1
Industries	15	10		

Appendix B lists the Michigan industries and municipalities which have discharges in Michigan's portion of the Lake Erie-Detroit River Basin and indicates those which have nutrient discharges that affect Lake Erie water quality. There are essentially no industries who presently discharge nutrients to the Detroit River or Lake Erie without prior treatment or partial removal. There are 49 municipal units whose discharges may contain nutrients that affect Lake Erie water quality. Thirteen of the municipal units have programs underway to improve their treatment. In accordance with Michigans approved interstate standards plan of implementation, all affected units of government will be expected to accomplish phosphorus removal by June 1, 1977.

WATER QUALITY STANDARDS

Since the 1968 reconvened conference, Michigan has adopted water quality standards and designated uses for its intrastate waters. This program plus the previously approved interstate standards program now provide standards for all of Michigan's waters. The one exception is temperature standards for fish, wildlife and other aquatic life for interstate waters. Public hearings to resolve the temperature standards are scheduled for the fall of 1969.

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FOR RECONVENED CONFERENCE

FIFTH SESSION

ON

POLLUTION OF THE INTERSTATE AND OHIO INTRASTATE WATERS OF LAKE ERIE AND ITS TRIBUTARIES
(INDIANA-MICHIGAN-NEW YORK-OHIO-PENNSYLVANIA)

CALLED BY
WALTER J. HICKEL
SECRETARY OF THE INTERIOR

STARTING JUNE 27, 1969
CLEVELAND, OHIO

ON BEHALF OF
THE
MICHIGAN WATER RESOURCES COMMISSION

JUNE 1969

MICHIGAN WATER RESOURCES COMMISSION

JOHN E. VOGT, Chairman, representing the Director, Department of Public Health

STANLEY QUACKENBUSH, Vice Chairman, representing the Director of Agriculture

GERALD E. EDDY, representing the Director of Natural Resources

JOHN P. WOODFORD, representing the State Highway Commission

GEORGE F. LIDDLE, Muskegon, representing Municipal Groups

LYNN F. BALDWIN, Eaton Rapids, representing Conservation Groups

JIM GILMORE, Kalamazoo, representing Industrial Management Groups

RALPH W. PURDY
EXECUTIVE SECRETARY

PURPOSE

At the reconvened conferences in Cleveland, Ohio, in 1966; in Buffalo, New York in 1967; and again in Cleveland in 1968, the Michigan Water Resources Commission reviewed the pollution control program that had been developed to abate pollution and enhance the Michigan waters of Lake Erie and its tributaries. The reports outlined how Michigan, in 1965, had established water quality goals for the Detroit River and Michigan waters of Lake Erie and how a voluntary pollution abatement program had been formed with the cooperation of industries and municipalities. The reports further set down the effluent restrictions and treatment facility construction time schedules required to achieve the desired water quality goals. Finally, the reports described the water quality, surveillance and effluent monitoring programs that have been established by the Michigan Water Resources Commission.

This report will review the compliance status of the previously approved abatement programs and time schedules and will present information on recent pollution control activities affecting water quality in Michigan's waters of Lake Erie.

CONSTRUCTION GRANT PROGRAM

Michigan has implemented a $285 million bond program for construction of municipal wastewater treatment plants. The bond money will enable communities to receive grants up to 55 percent of the cost of construction of treatment works. This is divided into a 25 percent outright state grant, a 25 percent state advance of anticipated future Federal funds and an expected 5 percent Federal grant. An additional $50 million bond issue has been approved by Michigan voters for construction of collecting sewers and is awaiting enabling legislation. Michigan has recognized its commitment by assisting its communities in financing needed treatment facilities and by advancing state bond moneys for anticipated Federal funds. It is requiring local units to provide the remaining funds with the guarantee that their advanced share will be reimbursed by future Federal moneys before the state receives reimbursement.

WATER QUALITY SURVEILLANCE OF THE MICHIGAN WATERS OF LAKE ERIE AND ITS TRIBUTARIES

The water quality surveillance program established by Michigan was described in detail to the conferees at Buffalo in 1967. The sampling and testing of the Detroit River and Lake Erie at 63 locations is continuing and the data obtained during 1966, 1967 and 1968 have been tabulated in Appendix C. Similar data for the 75 municipal and industrial waste discharges along the Detroit, Rouge, Huron and Raisin rivers is shown in Appendix D.

WATER MANAGEMENT BUREAU

Effective May 1, 1969 the staff of the Michigan Water Resources Commission was reorganized into a Water Management Bureau under the Michigan Department of Natural Resources. Formation of the Bureau consolidates many water management responsibilities into a single integrated unit with a Deputy Director at its head. The Deputy Director will continue to hold the title of Executive Secretary of the Water Resources Commission and the Water Resources Commission will continue in existence with the same membership it has had in the past. The reorganization has added submerged lands, lake engineering and oil pollution control functions to the new bureau

APPENDIX A

INDUSTRIAL AND MUNICIPAL PERFORMANCE STATUS

DETROIT RIVER-LAKE ERIE INDUSTRY STIPULATION DATES FOR COMPLIANCE

Industry	Preliminary Engineering Study and Basis of Design	Approval of Construction Plans and Specifications	Complete Construction	Comments
Allied Chemical Corporation				
Semet Solvay Division, Detroit		April 1, 1966	April 1, 1967	Facilities in operation. Performance has been variable. Improved operational procedures being undertaken by the Company.
Solvay Process Division, Detroit		November 1, 1966	April 1, 1968	The company has ceased operations at this location.
American Cement Corporation				
Peerless Cement Division, Detroit		May 1, 1966	May 1, 1967	Facilities in operation. In compliance.
Consolidated Packaging Corporation				
North Side Plant, Monroe	January 1, 1967	(January 1, 1968) (November 1, 1968) October 31, 1969	(January 1, 1969) (December 1, 1970) June 1, 1971	The Company has entered into a contract for secondary treatment of wastes, in the Monroe municipal metropolitan treatment plant. Compliance dates are now deemed to the same as for the City of Monroe. See comments under City of Monroe.
South Side Plant, Monroe	January 1, 1967	(January 1, 1968) (November 1, 1968) October 31, 1969	(January 1, 1969) (December 1, 1970) June 1, 1971	The Company has entered into a contract for secondary treatment of wastes in the Monroe municipal metropolitan treatment plant. Compliance dates are now deemed to be the same as for the City of Monroe. See comments under City of Monroe

Industry	Preliminary Engineering Study and Basis of Design	Approval of Construction Plans and Specifications	Complete Construction	Comments
*Darling and Company, Melvindale		November 1, 1966	(November 1, 1967) September 1, 1969	Partial compliance is being obtained through the use of an interim aerated lagoon.
E. I. duPont deNemours and Company, Inc.				
Industrial and Biochemical Division, Ecorse		April 1, 1966	April 1, 1967	The company has ceased operations at this location.
Firestone Tire and Rubber Company				
Firestone Steel Products Division, Riverview		November 1, 1966	November 1, 1967	The company has entered into a contract for the hauling away and disposition of all the spent pickle liquor and no longer discharges this material to the Detroit River.
Ford Motor Company				
Monroe Plant		December 1, 1966	(+24 months) February 15, 1969	Facilities complete. In compliance.
Rouge Plant				
other than iron and suspended solids		October 1, 1966	(+17 months) January 1, 1969	In compliance.
iron		March 1, 1967	(+24 months) April 27, 1969	Conversion to hydrochloric acid steel pickling lines with all spent liquor returned to the supplier has eliminated such discharges from this plant.
suspended solids		Maych 1, 1967	(+27 months) June 1, 1969	In compliance.

Industry	Preliminary Engineering Study and Basis of Design	Approval of Construction Plans and Specifications	Complete Construction	Comments
Great Lakes Steel Corporation				
80" Hot Strip Mill, Ecorse		November 1, 1966	April 1, 1968	Facilities in operation and in compliance.
Steel Rolling Mill, Ecorse other than acid and iron		November 1, 1966	April 1, 1968	Facilities in operation and in compliance.
other than acid and iron, No. 3 slabbing mill		October 1, 1967	October 1, 1968	New facilities in operation. In compliance.
acid and iron	April 1, 1967	December 1, 1967	April 1, 1969	The company has entered into a contract with the City of Detroit whereby the City will utilize all of the company's waste pickle liquor for nutrient removal thus eliminating such a discharge to the Detroit River. Storage and pumping equipment construction has been delayed. Expected by December, 1969.
Blast Furnace, River Rouge		November 1, 1966	April 1, 1968	Facilities in operation. Recent innovations indicate the company is operating in accordance with the terms of the Water Resources Commission Stipulation.
McLouth Steel Corporation, Trenton		November 1, 1966	April 1, 1968	Facilities in operation. In compliance.
Mobil Oil Company, Trenton		November 1, 1966	November 1, 1967	Additional oil treatment lagoons installed. In compliance.
Monsanto Company				
Trenton Plant	November 1, 1967	August 1, 1968	November 1, 1969	Plans have been approved, construction has been completed and facilities are in operation.
Trenton Resins Plant	(November 1, 1966) September 1, 1967	(April 1, 1967) December 1, 1967	(April 1, 1968) (September 1, 1968) November 1, 1968	Facilities complete and in operation.

Industry	Preliminary Engineering Study and Basis of Design	Approval of Construction Plans and Specifications	Complete Construction	Comments
Pennwalt Chemicals Corporation				
East Plant, Wyandotte		November 1, 1966	April 1, 1968	In compliance.
West Plant, Riverview		November 1, 1966	April 1, 1968	Improved treatment facilities in operation. In compliance.
Revere Copper, Brass and Aluminum, Inc., Detroit		November 1, 1966	November 1, 1967	In compliance.
*Scott Paper Company, Detroit for BOD	January 1, 1968	January 1, 1969	January 1, 1970	Cessation of pulping operations and the discharge of the paper mill wastes to the City of Detroit has resulted in compliance with the terms of the Water Resources Commission stipulation.
for solids		May 1, 1967	(May 1, 1968) August 19, 1968	
*Time Container Corporation				
Monroe Paper Products Division	January 1, 1967	(January 1, 1968) (November 1, 1968) October 31, 1969	(January 1, 1969) (December 1, 1970) June 1, 1971	The Company has entered into a contract for secondary treatment of wastes in the Monroe municipal metropolitan treatment plant. Compliance dates are now deemed to be the same as for the City of Monroe. See comments under City of Monroe.
*Union Camp Corporation, Monroe	January 1, 1967	(January 1, 1968) (November 1, 1968) October 31, 1969	(January 1, 1969) (December 1, 1970) June 1, 1971	The Company has entered into a contract for secondary treatment of wastes in the Monroe municipal metropolitan treatment plant. Compliance dates are now deemed to be the same as for the City of Monroe. See comments under City of Monroe.

Industry	Preliminary Engineering Study and Basis of Design	Approval of Construction Plans and Specifications	Complete Construction	Comments
Wyandotte Chemicals Corporation				
*North Works, Wyandotte		November 1, 1966	(April 1, 1968) January 1, 1969	Substantially in compliance. A program to achieve additional improvements is underway.
*South Works, Wyandotte		November 1, 1966	(April 1, 1968) January 1, 1969	Substantially in compliance. A program to achieve additional improvements is underway.

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*Original Stipulation dates shown in parentheses with current compliance dates shown directly below the original.

DETROIT RIVER-LAKE ERIE GOVERNMENTAL UNIT STIPULATION DATES FOR COMPLIANCE

Unit	Preliminary Engineering Study and Basis of Design	Approval of Construction Plans and Specifications	Complete Construction	Comments
*Berlin Township	May 1, 1967	May 1, 1968	(May 1, 1969) December 31, 1970	Township has defaulted on Final Order issued by the Commission. Referred to Attorney General August 28, 1968. Compliant has been filed in Circuit Court. Further court action pending.
*Frenchtown Township	May 1, 1967	(May 1, 1968) November 30, 1968	(May 1, 1969) December 1, 1970	Township has joined the Monroe metropolitan system with treatment of wastes at the City plant. New compliance dates were approved due to expanded service area and coordination with the metropolitan treatment plant improvement construction schedule. See comments under City of Monroe.
*Monroe Township	May 1, 1967	(May 1, 1968) November 1, 1968	(May 1, 1969) May 1, 1970	Township has joined the Monroe metropolitan system with treatment of wastes at the City plant. New compliance dates were approved due to expanded service area and coordination with the metropolitan treatment plant improvement construction schedule. See comments under City of Monroe.
Grosse Ile Township	April 1, 1967	November 1, 1968	November 1, 1970	Final plans approved. In compliance.
Wayne County				
Trenton Plant	April 1, 1967	November 1, 1968	November 1, 1970	Plans approved. In compliance.
Wyandotte Plant	April 1, 1967	November 1, 1968	November 1, 1970	Final plans not submitted by November 1, 1968. Commission has started adoption of Final Order of Determination. Hearing scheduled for July, 1969.
City of Detroit	April 1, 1967	November 1, 1968	November 1, 1970	City did not submit final plans by November 1, 1968 A show cause conference was held in January, 1969 at which time the City outlined the progress of its program. The Commission has agreed with the progress report. City is in compliance to date.

*Original Stipulation dates shown in parentheses with current compliance dates shown directly below the original.

Unit	Preliminary Engineering Study and Basis of Design	Approval of Construction Plans and Specifications	Complete Construction	Comments
Village of Estral Beach	May 1, 1967	May 1, 1968	May 1, 1969	Abatement program complete. In compliance.
City of Luna Pier	May 1, 1967	May 1, 1968	May 1, 1969	Waste treatment plant is 50 percent constructed. Completion expected by August, 1969.
*City of Monroe	May 1, 1967	(May 1, 1968) (November 1, 1968) October 31, 1969	(May 1, 1969) (December 1, 1970) June 1, 1971	Contractual agreements have been reached with the three Monroe area paper companies and two adjoining townships for joint waste treatment in the City's plant. Compliance dates were originally modified due to the expanded scope of the collection and treatment project. Progress was again delayed due to sludge treatment problems. The new dates have been proposed and are subject to Commission approval.
City of Riverview	April 1, 1967	November 1, 1968	November 1, 1970	Construction plans approved. In compliance.
City of Trenton	April 1, 1968	November 1, 1969	November 1, 1970	Preliminary plans approved. In compliance.

APPENDIX B

MICHIGAN'S INDUSTRIAL AND MUNICIPAL WASTE WATER DISCHARGE INVENTORY

DIRECT INDUSTRIAL DISCHARGES TO LAKE ERIE

Company Name	Product	Location	Treatment	Discharge Characteristics After Treatment			1969 Pollution Status Rating	Date of Order or Determination	Remarks	Affect Lake Erie Water Quality
				Flow MGD	5-day BOD lbs/day	Suspended Solids lbs/day				
Consumers Power Co. J. R. Whiting Plant	Electricity	Erie	Ash Lagoons	- - - No Data Available - - -						No

1969 Pollution Status Ratings are as of April 1, 1969 and reflect 1968 performances.

Affects listed for both municipal and industrial discharges refer to nutrients only.

INDUSTRIAL SURFACE WATER DISCHARGES IN THE MICHIGAN PORTION OF THE LAKE ERIE BASIN

APRIL—1969

Company Name	Product	Location	Receiving Stream	Treatment Provided	Discharge Characteristics after Treatment: Flow MGD	5-Day BOD lbs/day	Suspended Solids lbs/day	1969 Pollution Status Rating	Date of Order or Determination or Stipulation	Remarks	Affect Lake Erie Water Quality
St. Clair River											
Dunn Paper Company	Paper	Port Huron	---	Save-alls	- - - No Data Available - - -			[illegible]			No
Detroit Edison Company	Electricity	Marysville	---	Ash Lagoon	354.1						No
Detroit Edison Company	Electricity	St. Clair	---	Ash Lagoon	119.6				7/23/66	Cooling water	No
Diamond Crystal Salt Company	Salt	St. Clair	---	Settling pond and deep well disposal	- - - No Data Available - - -			[illegible]		Also [illegible] discharge to the Pine River	No
Marysville Plating Company	Plated parts	Marysville	---	Chemical	5.000			[illegible]	[illegible]		No
Lake St. Clair											
- - - No major industrial discharges [illegible] - - -											
Detroit River											
Allied Chemical Corp. Semet Solvay Division	Foundry coke and coke products	Detroit	---	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	No
Anaconda American Brass Company	Copper and Brass Products	Detroit	---	Neutralization and settling	[illegible]			[illegible]		Discharge to Detroit [illegible]	No
Chrysler Corp. Amplex Division	Pressed metal gears and parts	Detroit	---	Settling pond and oil skimmer	[illegible]	[illegible]	[illegible]	[illegible]			No
Chrysler Corp. Chem. Products Division	Adhesives, brake lining and automotive chemicals	Trenton	[illegible] Monguagon Drain	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			No
Chrysler Corp. Engine Plant	Automobile Engines	Trenton	[illegible] Elizabeth Park Canal	Air flotation, oil skimmer, chemical coagulation	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	No
Dana Corp.	Auto and truck frames and other steel structures	Ecorse	---	None	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	No
Detroit Edison Co.	Electricity	Connors Creek	---	Ash Lagoon	[illegible]					Primarily cooling water	No
Detroit Edison Co.	Electricity	Delray Plant	---	Ash Lagoon	[illegible]					Primarily cooling water	No
Detroit Edison Co.	Electricity	River Rouge	---	Ash Lagoon	[illegible]					Primarily cooling water	No
Detroit Edison Co.	Electricity	Trenton	---	Ash Lagoon	[illegible]			[illegible]	[illegible]	Primarily cooling water	No
Detroit Edison Co.	Electricity	Wyandotte	---	None	- - - No Data Available - - -			[illegible]		[illegible] October, 1968	No
Firestone Steel Products Co.	Automotive wheels and parts	Riverview	---	Oil separation ponds	2.168		[illegible]	[illegible]	[illegible]	White pickle liquor hauled from plant	No
Great Lakes Steel Corp. Ecorse Rolling Mill	Steel	Ecorse	---	Oil skimmers and settling basins	[illegible]		[illegible]	[illegible]	[illegible]	Recent improvements [illegible] White pickle liquor [illegible]	No

Company Name	Product	Location	Receiving Stream	Treatment Provided	Discharge Characteristics after Treatment Flow MGD	5-day BOD lbs/day	Suspended Solids lbs/day	1969 Pollution Status Rating	Date of Order of Determination or Stipulation	Remarks	Affect Lake Erie water Quality
Great Lakes Steel Corp., 80" Hot Strip Mill	Sheet Steel	River Rouge	---	Oil skimmers and settling basins	72.2		19,300	oil - E solids - B	3/29/66		No
Great Lakes Steel Corp., Blast Furnace Div.	Steel	River Rouge	---	Clarifiers, dephenolizer	87		64,170	oil - E solids - F phenols - B	3/19/66	Discharges to old river channel of Rouge [illegible]	No
McLouth Steel Corp.	Steel	Trenton	---	Chemical coagulation, settling, neutralization, oil separators	65.7		15,152	[illegible]	4/5/66		No
McLouth Steel Corp.	Steel	Gibraltar	via Frank and Poet Drain	Oil skimmers, lagoons, neutralization	1.64		[illegible]	[illegible]	[illegible]		No
Mobil Oil Company	Petroleum	Woodhaven	---	Oil separators, settling ponds	[illegible]		[illegible]	[illegible]	[illegible]		No
Monsanto Company Plastic Products and Resins Div.	Chemicals	Trenton	---	Neutralization pit with waste carbide slurry, activated sludge	0.4	3,590	[illegible]	[illegible]	[illegible]		No
Monsanto Company Inorganic Chemicals Div.	Chemicals	Trenton	---	Phosphorous removal, lagoons	[illegible]			B	[illegible]	[illegible]	No
Park Davis and Co.	Pharmaceuticals	Detroit	---	None	[illegible]			[illegible]		[illegible]	No
Pennwalt Chemicals Corp., Industrial Div. (East Plant)	Chemical	Wyandotte	---	Solids removal	50		[illegible]	B	[illegible]	[illegible]	[illegible]
Pennwalt Chemicals Corp. Organic Chemicals Div. (West Plant)	Chemicals	Riverview	via Monguagon Creek	Lagoons, oil skimmers	[illegible]		[illegible]	[illegible]	[illegible]		[illegible]
Revere Copper Brass and Aluminum, Inc.	Metal parts	Detroit	---	Oil separator, incinerator	[illegible]		[illegible]	[illegible]	[illegible]		No
U.S. Rubber Co.	Rubber and chemicals	Detroit	---	Oil skimmers	62		[illegible]	[illegible]			No
Wyandotte Chemicals Corp. North Works	Chemicals	Wyandotte	---	Settling ponds oil separater	[illegible]		[illegible]	[illegible]	[illegible]	[illegible] MGD	No
Wyandotte Chemicals Corp. South Works	Chemicals	Wyandotte	---	Settling ponds, oil skimmers	15.8		[illegible]	[illegible]	[illegible]	[illegible]	No
4. **Black River Basin**											
Croswell Pickle Co.	Canned pickles and peppers	Croswell	Black River	Aerated lagoons	0.3			B	[illegible]	[illegible]	No
Detroit Edison Co.	Electricity	Port Huron	Black River	Ash lagoons	0.720			B	[illegible]	[illegible]	No
Michigan Sugar Co.	Sugar	Croswell	Black River	Lagoons	3.0	3,300	[illegible]	[illegible]	[illegible]	Seasonal	No
Mid Michigan Materials Gravel Co.	Aggregates	Yale	Black River	Settling ponds	0.4			B		Seasonal	No
Port Huron Paper Co.	Carbon paper	Port Huron	Black River	Save-alls	14.4	3,900	4,500	B	[illegible]		No
Stokley Food, Inc.	Canned vegetables	Croswell	Black River	Spray irrigation and lagoons	- - - No Data Available - - -			A	[illegible]	Seasonal	No
5. **Pine River Basin**											
Diamond Crystal Salt Co.	Salt	St. Clair	Pine River	Settling Pond and Deep well disposal	Intermittent			B		Majority of effluent discharged to St. Clair River	No

Company Name	Product	Location	Receiving Stream	Treatment Processes	Discharge Characteristics After Treatment Flow MGD	5-day BOD lbs/day	Suspended Solids lbs/day	[illegible] Rating	[illegible]	Remarks	Affect Lake Erie Water Qual.
6. **Belle River Basin**											
Fox Weeks Packing Co.	Meat	[illegible]	Belle River via storm drain	[illegible]	0.0106	11.8	22.5	I			No
Plastic Tube Products Co.	Plastics	Imlay City	Belle River	[illegible]	1.8	150		II	[illegible]	[illegible]	No
7. **Clinton River Basin**											
Auburn Hts. Manufacturing Company	Gears and castings	Auburn Hts.	[illegible]	Oil skimmer tank	- - - No Data Available - - -			B			No
Briggs Manufacturing Co.	Porcelain articles	Sterling	[illegible]	[illegible]	1.1	[illegible]	160	[illegible]	[illegible]		No
Ford Motor Co. Proving Ground	Automotive testing facilities	Bruce Twp. Macomb Co.	[illegible]	Septic tank and sand filters	- - - No Data Available - - -			A	[illegible]	[illegible]	No
Ford Motor Co. Glass and Chemical Div. Paint Plant	Automotive paint	Mt. Clemens	[illegible] Drain	None	- - - No Data Available - - -					[illegible]	No
Ford Motor Co. Glass and Chemical Div. Plastics Plant	Plastic automotive accessories	Mt. Clemens	[illegible] Drain	None	- - - No Data Available - - -						No
Ford Motor Co. Transmission and Chassis Div.	Automotive parts	Sterling	Moore Drain	Oil separation, [illegible] filters, [illegible], holding pond	1.492	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	No
Ford Motor Co. Automotive Assembly Div.	Auto fabric and trim	Utica	Clinton-Kalamazoo Canal	[illegible] filters and tertiary settling	0.105	11	[illegible]	A		[illegible]	No
Higbe Manufacturing Co. Avon Tube Division	Metal tubing	Rochester	Paint Creek	None	- - - No Data Available - - -			A		[illegible]	No
LTV Aerospace Corp. Missles and Space Div.	Missile components	Sterling	[illegible] Drain	Filter, tertiary settling and chemical treatment	0.773	0.0	183	A	[illegible]		No
National Machine Products	Nuts and bolts	Utica	Clinton River	Holding ponds	0.231	32.8 lbs.	73.7 lbs.	B	[illegible]	[illegible]	No
National Twist Drill and Tool Co.	Rotary cutting tools	Rochester	Stoney Creek via drain	Chemical treatment, settling pond and oil skimmers	0.2	18	41	A			No
Rochester Paper Co.	Paper	Rochester	Clinton River	Save-all and settling pond	0.2	165	470	[illegible]			No
Superior Products Co.	Stamped metal parts	Auburn Hts.	Clinton River	Oil holding tank	- - - No Data Available - - -			Oil - B Sanitary - [illegible]		[illegible]	No
TRW, Inc. Michigan Division	Power Brakes and Steering (Auto)	Sterling Heights	Big Beaver Creek	Trickling filter, oil separation, settling ponds	.152	26	31	Industrial - [illegible] Sanitary - B	[illegible]	[illegible]	No
8. **Rouge River Basin**											
A.B.C. Photo, Inc.	Photo Processing	Novi	Middle Rouge River	Aeration and lagoons	0.04			B	[illegible]	[illegible]	No
Allied Chemical Corp. Plastics Division	Coal tars and oils	Detroit	Rouge River	Dephenolizer, settling basins, oil skimmers	0.48						No

Company Name	Product	Location	Receiving Stream	Treatment Facilities	Discharge Characteristics after Treatment Flow MGD	5-Day BOD lb/day	Suspended Solids lb/day	1969 Pollution Status Rating	Date of Order of Determination or Stipulation	Remarks	Affect Lake Erie Water Quality
Allied Chemical Corp., Industrial Chemicals Div., Detroit Chemical Works	Chemicals	Detroit	Rouge River	[illegible]	9.11		4,990	B			No
American Cement Corp., Peerless Division, Plant 1	Cement	Detroit	Old Channel Rouge River	Settling Tank	8.1		4,870	D	4/5/66		No
Plant 2	Cement	Detroit	Rouge River	None	- - - No Data Available - - -			D	4/5/66		No
Associated Spring Corp., [illegible] Div.	Various types of springs	Plymouth	Middle Rouge River	None	0.174	60	150	A		Major process wastes are discharged to municipal system	No
Burroughs Corp.	Business Machines	Plymouth	Middle Rouge River	Oil sump	0.326	81.1	547	A			No
Can Chem Co.	Petroleum Products	Wayne	Tributary Drain	Ponds	- - - No Data Available - - -			B	10/29/68	Additional treatment underway	No
Darling and Co.	Rendering Products	Melvindale	Rouge River	Aerated lagoons	1.13	640	282	solids & grease = D oxygen = D	3/26/67		No
Enamelum Corp. and Interlake Windows	Aluminum Products	Novi	Walled Lake Creek	Lagoons and chemical treatment	0.08	0.0	14	E			No
Evans Products Co.	Railroad cars and various metal products	Plymouth	Middle Rouge River	Oil skimmer	0.213	28.4	33.7	A	9/8/67	Majority of wastes are discharged to municipal system	No
Ford Motor Company Rouge Plant	Steel, castings, glass and automotive parts	Dearborn	Rouge River	Oil skimmers, deep well disposal and clarifier	362		311,700	acid = E oil = E_2 cyanide = B solids = E_2 phenols = B_2	5/17/66	Flow does not include overflow from powerhouse	No
Ford Motor Co. Engine and Foundries Div., Valve Plant	Automotive Parts	Northville	Middle Rouge River	None	0.05			B		Cooling water only; industrial wastes are discharged to municipal systems	No
Ford Motor Co. Auto Assembly Div.	Automotive Assembly	Wayne	Lower Rouge River	Settling pond for paint wastes	0.465		47	B		Major pollutional wastes to municipal system	No
Federal Mogul Corp. [illegible] Div.	Gears, Bearings and other metal products	Northville	Middle Rouge River	Oil collection	0.0875	3.6	14.6	B			No
General Filters, Inc.	Filters	Novi	Middle Rouge River	Small earthen settling pond	5 (gpm)	48 (mg/l)	137 (mg/l)	C			No
General Motors Corp. Detroit Diesel Engine Div.	Automotive parts	Detroit	Rouge River	Oil separators and settling tanks	- - - No Data Available - - -			B_1		Further treatment facilities planned	No
General Motors Corp. Chevrolet Motor	Automotive parts	Livonia	Middle Rouge River		- - - No Data Available - - -					Cooling water only, industrial wastes discharged to municipal system	No
General Motors Corp. Parts Distribution Center	Service	Wayne	Lower Rouge River	Imhoff tank and trickling filter	- - - No Data Available - - -			A		Sanitary wastes only	No
Great Lakes Steel Corp. Blast Furnace Div., Zug Island	Steel	River Rouge	Rouge River	Clarifiers and dephenolizer	- - - No Data Available - - -			oil = B solids = E_1 phenol = B	1/19/66	Main discharges to Detroit River	No

Company Name	Product	Location	Receiving Stream	Treatment Provided	Discharge Characteristics after Treatment: Flow MGD	5-day BOD lbs/day	Suspended Solids lbs/day	1969 Pollution Survey Rating	Date of Order or Determination or Stipulation	Remarks	Affect Lake Erie Water Quality
Michigan Seamless Tube Co., Standard Tube Div.	Metal tubes	[illegible]	[illegible]	Oil skimmers and lagoon	.245	24.3	149	B			No
[illegible] Paper Co.	Paper	[illegible]	Rouge River	[illegible]	- - - No Data Available - - -			[illegible]	[illegible]	[illegible]	No
Townsend [illegible] Products	Metal [illegible]	Plymouth	Middle Rouge River	None	- - - No Data Available - - -			[illegible]			No
Trilex Corp.	Plated metal parts	[illegible]	Lower Rouge River	Chemical [illegible]	0.28	[illegible]	[illegible]	E	[illegible]	New treatment facilities [illegible]	No
United [illegible] Corp., Whitmer and Barber Div.	[illegible]	[illegible]	Middle Rouge River	None	15 [illegible]			[illegible]		[illegible]	No
Huron River Basin											
Belleville Plating Co.	Plated metal parts	Belleville	Huron River	Chemical treatment and settling pond	0.02			A	[illegible]		No
Chrysler Corp., [illegible] Div.	Automotive parts	[illegible]	Huron River	Chemical treatment, settling pond, [illegible] filter		1.9	1.2	A	[illegible]		No
D.T. & I. Railroad Yards	Railroad Terminal	Flat Rock	[illegible] Creek	Oil separators	- - - No Data Available - - -			E			No
Federal Screw Works	Steel [illegible]	Chelsea	Letts Creek	Leach Pits	- - - No Data Available - - -			B			No
Ford Motor Co. Automotive Assembly Div.	Automotive assembly	Wixom	Norton Drain	Chemical treatment, holding ponds, trickling filter	1.411	795.89	229.11	[illegible]	[illegible]	[illegible]	No
Ford Motor Company General Parts Div.	Automotive Parts	Ypsilanti	Huron River		- - - No Data Available - - -			E		[illegible]	No
General Motors Corp. Fisher Body Div.	Automotive parts	Willow Run	Willow Creek	Primary settling and secondary lagoon	.640	800	128	[illegible] oxygen demand - B	[illegible]		No
Hoover Ball & Bearing Co.	Metal Bearings	[illegible]	[illegible] Drain	Trickling filter	.007			B	[illegible]	[illegible]	No
Hoover Ball & Bearing Co. Chemical Products Div.	Chemicals	Whitmore Lake	[illegible] Lake Outlet Drain	None	0.108			A	[illegible]	[illegible]	No
Huron Valley Steel Corp.	Pig iron	Belleville	Huron River	Settling ponds	1.1			B	[illegible]		No
Longworth Plating Co.	Plated metal parts	Chelsea	Letts Creek	Chemical treatment, settling tanks	0.0104		2	[illegible]	[illegible]		No
Michigan Seamless Tube Co.	Metal tubing	South Lyon	Huron River [illegible]	Settling tanks	1.2	163	965	E	[illegible]	Additional treatment under construction	No
[illegible] Stearns, Subsidiary of Federal Engineering	Aluminum doors and window frames	Flat Rock	Huron River	Acid neutralization	0.078			[illegible]	[illegible]		No
Ottawa Silica Co., Michigan Silica Div.	Silica	Rockwood	Huron River	Settling ponds	5.70		15,710	B			No
[illegible] Standard Corp., Spring Div.	Steel springs	Chelsea	Letts Creek	Oil collection	- - - No Data Available - - -			A		Cooling water only	No
University [illegible]	Photo Developing	Ann Arbor	Honey Creek	Aeration tanks	0.328	125	36	A	[illegible]		No

					Discharge Characteristics After Treatment						
[illegible]	[illegible]	[illegible]	[illegible]	Treatment Provided	Flow MGD	[illegible] BOD lb/day	Suspended Solids lb/day	[illegible] Rating	[illegible]	Remarks	[illegible]
[illegible]											
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]	[illegible]	No
River Raisin Basin											
Buckeye Products	Plated parts	Adrian	River Raisin	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	No
Consolidated Packaging Corp., North Side Plant	Paper	Monroe	River Raisin	Clarification	[illegible]	14,094	[illegible]	[illegible]	[illegible]		No
Consolidated Packaging Corp., South Side Plant	Paper	Monroe	River Raisin	Clarification	[illegible]	8,780	[illegible]	[illegible]	[illegible]		No
Culligan Soft Water Services	Water softener [illegible]	Adrian	S. Branch River Raisin	None	[illegible]	[illegible]	[illegible]		[illegible]		No
Dundee Cement Co.	Cement	Dundee	[illegible] Creek	[illegible] treatment and settling ponds	1.93	128	[illegible]	[illegible]	[illegible]		No
Ford Motor Co. Metal Stamping Div.	Automotive parts	Monroe	River Raisin	[illegible] treatment and settling ponds	1.26			B	[illegible]	[illegible]	No
Faraday, Inc.	Plated parts	Adrian	River Raisin	Chemical treatment	[illegible]	[illegible]	14	B	[illegible]		No
Home Canning Co.	Canned tomatoes and other vegetables	Blissfield	River Raisin	[illegible]	[illegible]			[illegible]			No
Hoover Ball & Bearing Co., Manchester Div.	Plated metal parts	Manchester	River Raisin	Chemical treatment and settling ponds	0.220	96	190	B	[illegible]		No
Hoover Ball & Bearing Co., Universal Die Casting Division	Castings and plated metal parts	Saline	Saline River	Chemical treatment and settling ponds	0.460	19.5	[illegible]	[illegible]	[illegible]	[illegible]	No
Simplex Paper Corp.	Paper	Palmyra	River Raisin	Saveall	[illegible]	807	5,206	[illegible]	[illegible]	[illegible]	No
Stauffer Chem. Co.	Organic compounds	Tecumseh	River Raisin	Aeration, settling ponds, [illegible] sludge	.079	23.7	[illegible]	B	[illegible]	[illegible]	No
Stauffer Chem. Co.	Organic compounds	Weston	Black Creek	Aeration, settling ponds, [illegible]	.279	345	[illegible]	[illegible]	[illegible]	[illegible]	No
Tecumseh Products Co. Peerless Gear & Machinery Div.	Machine parts	Clinton	River Raisin	Small settling ponds	[illegible]			[illegible]			[illegible]
Tecumseh Products Co.	Refrigeration units	Tecumseh	River Raisin	Oil separation and acid neutralization	0.55	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	No
Time Container Corp. Monroe Div.	Paper	Monroe	River Raisin	Clarifiers	2.5	110	141	solids = [illegible] oxygen = [illegible]	[illegible]		No
Union Camp Corp.	Paper	Monroe	River Raisin	Clarifiers	4.5	8,916	4,512	solids = [illegible] oxygen = [illegible]	[illegible]		No
Maumee River Basin											
Hudson Plating Co.	Plated metal parts	Hudson	Bear Creek	Chemical treatment, settling.	0.057		[illegible]	B	[illegible]	[illegible]	[illegible]
M & S Manufacturing Co.	Metal parts	Hudson	Bear Creek	Septic tank and field	- - No Data Available - - -			[illegible]	[illegible]	[illegible]	No

MICHIGAN'S
MUNICIPAL WASTE WATER DISCHARGE
INVENTORY
MAY-1969

Community	Receiving Waters	Treatment Provided	Population (1964 est.)	Discharge Characteristics			Status and Abatement Action	Affect Lake Erie Water Quality	IMPROVEMENT NEEDS		PROGRAM FOR REMEDIAL FACILITIES Staff objectives subject to Commission review		
				Flow MGD	5-day BOD Effluent mg/l	Suspended Solids Effluent mg/l			Nutrient Reduction	Raw or Improved Treatment	Plans Approved	Start Construction	Complete
ST. CLAIR RIVER													
Algonac	St. Clair River	Primary	3,300	- - - No Data Available - - -			A voluntary stipulation is pending which states that the city will complete secondary treatment facilities by June 1, 1972 and accomplish 80 percent total phosphorous removal by June 1, 1977.	Yes	x	x			
East China Township	St. Clair River	Activated sludge	250	0.19	10	16	Plans for additional sanitary sewer construction approved July 12, 1968.	No					
Marine City	St. Clair River	Primary	3,800	0.6	38	49	A volundary stipulation is pending which states that the city will complete secondary treatment facilities by June 1, 1972 and accomplish 80 percent total phosphorous removal by June 1, 1977.	Yes	x	x			
Marysville	St. Clair River	Primary	4,900	0.93	54	59	A voluntary stipulation is pending which states that the city will complete secondary treatment facilities by June 1, 1972 and accomplish 80 percent total phosphorous removal by June 1, 1977.	Yes	x	x			
Port Huron	St. Clair River	Primary	36,300	11.24	44	66	Stipulation executed May 16, 1969. Engineering study on basis of design due 6-1-69.	Yes	x	x	Secondary plus nutrient 12-1-70 Lesser degree plus nutrient 6-1-74	6-1-71 6-1-75	12-1-72 6-1-77
LAKE ST. CLAIR													
Huron-Clinton Metropolitan Authority Metropolitan Beach	Lake St. Clair	Sand Filter	15,000	- - - No Data Available - - -				Yes	x				
DETROIT RIVER													
Detroit	Detroit River	Primary	1 620,000	720.3	40	90	Stipulation executed May 19, 1966.	Yes	x	x	11-1-68	---	11-1-70
Grosse Ile Twp.	Detroit River	Primary	6,318	1.28	53	40	Stipulation executed March 29, 1966.	Yes	x	x	11-1-68	---	11-1-70
Riverview	Detroit River	Primary	8,000	1.68	150	71	Stipulation executed April 5, 1966.	Yes	x	x	11-1-68	---	11-1-70
Trenton	Detroit River	Primary	22,000	3.09	95	92	Stipulation executed June 7, 1966.	Yes	x	x	11-1-69	---	11-1-70
Wayne County Trenton	Detroit River	Primary		1.5	61	46	Wayne County stipulation executed May 17, 1966.	Yes	x	x	11-1-68	---	11-1-70
Wayne County Wyandotte	Detroit River	Primary	46,000	47.09	85	60	Stipulation executed May 27, 1966. Show Cause Conference held April 17, 1969, recessed to July, 1969 meeting.	Yes	x	x	11-1-68	---	11-1-70
4. BLACK RIVER BASIN													
Brown City	Black River	Lagoons	903		6	19		No					
Croswell	Black River	Trickling Filter	1,817	0.26	21	17	Final Order adopted January 24, 1950.	No					

Community	Receiving Waters	Treatment Provided	Population (1964 est.)	Flow MGD	Discharge Characteristics 5-day BOD Effluent mg/l	Suspended Solids Effluent mg/l	Status and Abatement Action	Affect Lake Erie Water Quality	IMPROVEMENT NEEDS Nutrient Reduction	New or Improved Treatment	PROGRAM FOR REMEDIAL FACILITIES Staff objectives subject to Commission review Plans Approved	Start Construction	Complete
Sandusky	Black River	Trickling Filter	2,066	0.44	29	29	Final Order adopted November 29, 1951	Yes	x				
Yale	Black River	Lagoons	1,621	40	- No Data Available -		Final Order adopted December 6, 1956	No					
5. PINE RIVER BASIN													
St. Clair	Pine River	Primary	5,000	0.35	48	33	A voluntary stipulation is pending which states that the city will complete secondary treatment facilities by June 1, 1972 and accomplish 80 percent total phosphorous removal by June 1, 1972.	Yes	x	x			
6. BELLE RIVER BASIN													
Capac	County Drain Belle River	Lagoons	1,235	45	- No Data Available -		Construction plans for additional sanitary sewers approved September, 1968	No					
Imlay City	Belle River	Trickling Filter	1,960	0.17	26	11	Construction plans for additional sanitary sewers approved February 1968	Yes	x				
Memphis	Belle River	Lagoons	996	20	- No Data Available -		Construction plans for additional sanitary sewers approved December, 1968	No					
SALT RIVER BASIN													
New Baltimore	Salt River	Trickling Filter	3,700	0.29	26	16	Plans for additional sanitary sewer construction approved March, 1968	Yes	x				
New Haven	Salt River	Trickling Filter	1,198	0.08	26	12	Plans for additional sanitary sewer construction approved September, 1966	No					
Richmond	Salt River	Trickling Filter	3,200	0.48	15	14	Separation of sewers undertaken by the city	Yes	x				
CLINTON RIVER BASIN													
Almont	N. Branch Clinton River	Trickling Filter	1,279	0.16	6	17	Construction plans for additional sanitary sewers approved June, 1967	No					
Armada	E. Branch Coon Creek	Trickling Filter	1,111	0.13	22	26		No					
Clinton Twp. Plant #1	Clinton River	Trickling Filter		1.33	41	37	A March 8, 1967 contract with Macomb County will result in a hook-up to that county's wastewater disposal system.	Yes	x	x			
Clinton Twp. Plant #2	Clinton River	Trickling Filter		1.29	21	27	A March 8, 1967 contract with Macomb County will Result in a hook-up to that county's wastewater disposal system.	Yes	x	x			
Mount Clemens	Clinton River	Trickling Filter	[illegible]	4.3	46	61	Referred to Attorney General January 16, 1969. Court action pending. Final Order adopted March 26, 1968.	Yes	x	x	Metropolitan system 7-1-68 Independent system 1-1-69	[illegible]	[illegible]
Oakland County (Oakland University)	Clinton River	Trickling Filter			52	105		Yes	x				

				Discharge Characteristics					IMPROVEMENT NEEDS		PROGRAM FOR REMEDIAL FACILITIES Staff objectives subject to Commission review		
Community	Receiving Water	Treatment Provided	Population ([illegible] est.)	Flow MGD	5-Day BOD Effluent mg/l	Suspended Solids Effluent mg/l	Status and Abatement Action	Affect Lake Erie Water Quality	Nutrient Reduction	New or Improved Treatment	Plans Approved	Start Construction	Complete
Pontiac - #1	Clinton River	Activated sludge	89,000	11.6	9	26	Final Order adopted August 27, 1959	Yes	x				
Pontiac - #2	Clinton River	Activated sludge		4.0	6	10	Final Order adopted August 27, 1959.	Yes	x				
Rochester	Clinton River	Activated sludge	5,300	1.81	11	5		Yes	x				
Romeo	East Pond Creek	Primary	4,400	0.35	31	28		Yes	x				
Selfridge Air Force Base	Clinton River	Activated sludge	- - - No Data Available - - -					Yes	x				
Sterling Heights	Clinton River	Activated sludge	2,000	1.19	70	157	A March 7, 1967 contract stipulates this city will connect to the Macomb County Wastewater Disposal System.	Yes	x	x			
Utica	Clinton River	Activated sludge	1,454	0.39	10	12	A March 7, 1967 contract stipulates this city will connect to the Macomb County Wastewater Disposal System.	Yes	x	x			
Warren	Red Run	Activated sludge	20,000	27.3	13	23	City is in default of Water Resources Commission Stipulation executed August 29, 1967 and has asked for a hearing.	Yes	x	x	1-1-69	---	6-1-70
RIVER ROUGE BASIN													
- - - - No Municipal Waste Treatment Plant Discharges in the River Rouge Basin - - - -													
HURON RIVER BASIN													
Ann Arbor	Huron River	Activated sludge	74,000	14.2	44	130		Yes	x	x			
Brighton	Huron River	Trickling filter	2,282	0.63	24	18	City has agreed to accelerate its program of phosphate removal.	Yes	x				
Chelsea	Mill Creek	Activated sludge	3,600	0.34	16	11	A voluntary reduction of phosphorus compounds in the discharge is being sought by Water Resources Commission	Yes	x				
Dexter	Huron River	Primary	1,102	0.13	213	171	A voluntary reduction of phosphorus compounds in the discharge is being sought by Water Resources Commission	No					
Huron-Clinton Metropolitan Authority	Kent Lake	Sand filter	1,300	- - - No Data Available - - -				Yes	x				
Milford	Huron River	Trickling filter	4,300	0.67	11	29	Final Order November 1, 1950. The Commission has asked for phosphorous removal by 6-1-70.	Yes	x				
Northville	Huron River	Trickling filter	3,279	0.77	6	50	Final Order November 1, 1950. The Commission has asked for phosphorous removal by 6-1-70.	Yes	x				
[illegible] Authority	Huron River	Trickling filter		[illegible]	6	40		No					
[illegible]	Huron River	Activated sludge	[illegible]	0.12		11	A voluntary reduction of phosphorus compounds in the discharge is being sought by Water Resources Commission	No					
[illegible]	Huron River	Lagoons	[illegible]	- - - No Data Available - - -				No					
[illegible]	Huron River	Trickling filter			40	116	Waterford Township is in the advanced stages of a water pollution abatement program.	Yes	x	x			
[illegible]	Huron River	Trickling filter			70	76	Waterford Township is in the advanced stages of a water pollution abatement program.	Yes	x	x			

Community	Receiving Waters	Treatment Provided	Population [illegible]	Discharge Characteristics: Flow MGD	5-day BOD Effluent mg/l	Suspended Solids Effluent mg/l	Status and Abatement Action	Affect Lake Erie Water Quality	IMPROVEMENT NEEDS: Nutrient Reduction	New or Improved Treatment	PROGRAM FOR REMEDIAL FACILITIES Staff objectives subject to Commission review: Plans Approved	Start Construction	Complete
Wayne County Flat Rock	Huron River	Primary	[illegible],100	3.44	79	62	The city was ordered to proceed with the construction of improved treatment facilities by a court order issued 9-10-68. A Final Order was adopted 5-26-67.	Yes	x	x	10-1-68	11-30-68	12-31-69
Wayne County Rockwood	Huron River	Primary	[illegible]	0.19	90	50	Final Order adopted January 15, 1969	Yes	x	x	5-1-69	10-1-69	10-1-70
Ypsilanti City	Huron River	Activated sludge	20,958	4.[illegible]	14	22		Yes	x	x			
Ypsilanti State Hospital	Saline River	Trickling filter	4,000	- - - No Data Available - - -				Yes	x				
Ypsilanti Twp.	Huron River	Activated sludge	22,800	1.5	30	62	Joint agreement with Department of Public Health and Water Resources Commission. Bids taken 5-8-69 for sewer to connect to Wayne Co. system	Yes	x	x		10-1-68 under construction	5-1-69
SWAN CREEK BASIN													
Carleton	Swan Creek	Lagoons	1,179	50	11	46		No					
12. RIVER RAISIN BASIN													
Adrian	River Raisin	Activated sludge	19,800	2.34	6	13		Yes	x				
Blissfield	River Raisin	Primary	2,600	0.32	59	62	Final Order adopted September 25, 1951	Yes	x				
Clinton	River	Primary	1,481	0.07	138	132		No					
Dundee	River Raisin	Primary	2,377	0.13	64	46	Final Order adopted September 25, 1951	Yes	x				
Manchester	River Raisin	Trickling Filter	1,568	0.25	10	20	Final Order adopted June 27, 1951	No					
Milan	Saline River	Trickling Filter	3,616	0.41	19	14	Final Order adopted September 25, 1951.	Yes	x		11-1-68	2-1-69	12-1-70
Monroe	River Raisin	Primary	25,600	4.46	54	54	Stipulation executed 3/29/66. The City has requested further extension of dates which is under Commission consideration.	Yes	x	x			
Saline	Saline River	Trickling Filter	2,334	1.07	34	29	Final Order September 25, 1951.	Yes	x				
Tecumseh	River Raisin	Activated sludge	7,100	0.99	15	11	Order of Determination August 25, 1969	Yes	x				
13. MAUMEE RIVER BASIN													
Hudson	Bean Creek	Trickling Filter	2,390	0.27		21		Yes	x				
Morenci	Bean Creek	Lagoons	2,053	80	[illegible]	53		No					

Total yearly volume discharged.

MR. STEIN: Thank you.

Are there any comments or questions on the Michigan report?

Mr. Poole.

MR. POOLE: Well, I have a question. I don't know if it is germane to the conference, but I don't quite understand on page five your last sentence where you are discussing construction grants, where you would say the local units have been assured they will be reimbursed by future Federal moneys before the State has any reimbursement.

I thought earlier that the State was reimbursing the Federal share.

I guess I have answered my own questions. You are only reimbursing half the Federal share, aren't you?

MR. FROST: The State is reimbursing half the Federal funds, yes, and the municipality is advancing the other half if Federal funds become available.

MR. POOLE: You give the municipalities theirs first. In other words, the States are taking the big gamble. We are holding the bag.

MR. STEIN: In effect, they are taking a second mortgage.

MR. POOLE: Yes.

MR. STEIN: Are there any other comments or questions on the Michigan report?

Well, I think this represents a substantial progress, as does the Indiana report, and I would like to emphasize one phrase that you put in kind of as an ad lib, because I know when the engineers sometimes make a statement, it might not sound -- while it is accurate, the full impact of that is not there, and that deals with phosphorus removal.

All affected units of government will be expected to accomplish phosphorus removal by June 1, 1977. However, as I understand the Michigan program is this waste from 90 percent of the population will have effective phosphorus removal in by 1972, is that correct?

MR. FROST: Ninety percent of those in the basin -- in the Lake Erie Basin.

MR. STEIN: Yes.

MR. FROST: Yes, sir.

MR. STEIN: Because I think that is rather significant.

MR. POOLE: Let me ask a question. When you say "all," are you talking about these communities of 500 or 600?

MR. FROST: No, starting at 2,000.

MR. POOLE: Well, in other words, all above 2,000 by 1977, is that correct now?

MR. FROST: At the present status, yes.

MR. STEIN: Are there any other comments or questions?

MR. POSTON: Mr. Chairman.

MR. STEIN: Yes.

MR. POSTON: I think it is important that we ask a couple of questions regarding secondary treatment status for Detroit.

Our present conference recommendation calls for completion of this necessary treatment.

MR. STEIN: Mr. Poston, we are going to have -- at least my old friend, I don't know about you -- Jerry Remus here, who will be speaking for Detroit.

Why don't we hold the questions on Detroit until Mr. Remus makes his appearance.

Any other questions?

Mr. Purdy.

MR. PURDY: At this time, I would like to call on Mr. Remus, the Detroit Water Board, to make a statement.

STATEMENT OF GERALD J. REMUS, GENERAL
MANAGER, DETROIT METROPOLITAN WATER
SERVICES, DETROIT, MICHIGAN

MR. REMUS: Thank you, Mr. Chairman.

Conferees, I have a report here which updates our statements of one year ago, and if you would like, we will pass those out.

MR. STEIN: Do you want these to appear in the record, Mr. Remus?

MR. REMUS: I would like to have those in the record.

MR. STEIN: Without objection, these will be placed in the record as if read.

MR. REMUS: In order to orient ourselves to the portion of this responsibility that I am talking about, I believe you should know that the Detroit Metropolitan Sewerage System takes care of the Detroit River area from the River Rouge upstream, and have contracts for 71 communities besides Detroit, 54 now being served, and that these are the easterly part of Wayne County, including Detroit, of course, and the first row of communities adjacent to Detroit on the westerly side, and Oakland and Macomb Counties.

We have contracts with Macomb County to take care of all their pollution; with Oakland County for substantially all of it; and are now negotiating for the westerly portion of this area.

I think that the points relative to our program will be brought out as I go over this report. I will not read it, but I would call your attention to the fact that attached to this report that I have prepared on updating our operations is last year's report that I presented to the Conferees, which gives you the details under which the program was developed. My comments today are geared entirely to the facts of what progress we have made in this last year.

We reported a year ago on the fact that we had a 200 gallon per minute test facility pilot plant installed, and since that time we have established, after 17,000 tests, what our treatment process should be, and it is stated in the report we have established that we can meet the 80 percent phosphate removal. But I would like to comment that we think that is a rather poor type of language because actually we were down below two parts per million in our phosphorus removal in our approach that we were taking to the problem.

Specifically I want to emphasize that getting down below two parts is a goal, not whether you have 80 percent or not. Depending on what that might be, that might be four parts in some areas and five or one, depending on what type of sewage you are dealing with.

The treatment process, I would like to read: It has now been concluded that the treatment process will be a combination of the activated sludge process, step feed modification, and chemical precipitation of the phosphate using steel pickle liquor (ferrous chloride) and further that the final design of the aeration tanks incorporate the flexibility of the pilot plant so that efficiency and economy can be obtained through the full range of quality and quantity variations that will occur in the area's system.

We have learned from the operation of the test facility that the new plant must:

1. Provide flexibility of operation because of variations in the sewage due to new wastes, daily or seasonal variations.

2. Provide a plan for easy expansion of the plant to allow for an increase in quantity or loading of the influent.

3. Provide flexibility to vary the process in order to lower operating costs.

It is planned to operate the test facility as a continuing research facility to keep us acquainted with the variations in the type of wastes we must treat, to study the possibilities of changes in process, to study the variations in loading and to investigate the value of improved treatment methods.

G. J. Remus

Further, we would like to call your attention to the fact that this test facility will not be shut down since we have now arrived at our basic treatment, and we will continue to operate it as a test facility for improvement.

Now, where are we in the development of the system? As we pointed out last year, and again later in the report, the first round of construction last year was reported as -- on the basis of old estimates -- $104 million. It is now $159 million because of installation costs and additions.

We have improved the plant and purchased 27 acres and have all but one house of the 200 residences there removed, so that facility is ready to go.

We have done a lot of basic work in the plant preparatory to adding to it, and some of the test facility factors are ready, and contracts are under way. We are expanding our system to pick up those wastes that we talked about, and there is a listing of how many dollars of construction are under way.

I would like to point out, at this time, that the day before yesterday we received formal notice or telephone call -- formal notice isn't here yet, but we take their word -- the Water Resources Commission of the State of

Michigan says that we would be eligible for $44 million of construction money from the State grant providing we can get the construction under way this year.

We have our portion of this financing organized. In order to relieve the State people a little bit about $11 million of that $80 million is already under construction. We gambled some on that, but we have a long program, and a hard program to carry through, and if we wait for all of the factors to clear up, of course, we wouldn't be done on time.

Now, to get our system in shape so that we could treat the sewage without being drowned out in floods and things like that, we worked out a storm overflow control program wherein we automate our storm water pumping stations. The cost of the controls is $2,113,000. This is potentially complete. This involves 13 telemetering rain gages, 66 sewer level gages in combined sewers, 37 gages in interceptor sewers, 71 overflow indicators at backwater gates or dams, and remote control equipment to operate two sanitary and five storm pumping stations by remote control.

The purpose here, of course, is to keep our system properly pumped down and properly operated so that we can handle the minimum or maximum of one-half inch of storm flow hopefully, if the storm comes into the area, properly, and to keep the system empty enough to satisfy every flash storm we have so that it does not discharge overflow into the river.

The record shows we have been able to cut those bills down considerably by this type of operation. Although it has been manual up to now, we think we will be able to do better.

Another point that I wish to emphasize on: Each of these that were discussed in detail in the attached report last year is the pollution from industry standpoint. As I mentioned, all industry from the Rouge River up, discharged in the public system in the full area that we serve. There is no industry that discharged direct into the streams that we serve, in the streams of the area. All goes into our system.

Now, this has some good factors and some bad. There are factors of unknowns, of course, as to what comes into the system. To be able to have better control of what is coming in now and what would be developing for the future, we have organized six full-time people that work on this and part-time employees as well, and we have talked to 606 different companies, and our industrial program, we think, is beginning to pay very good dividends.

G. J. Remus

We have been able to work with the larger companies such as Chrysler and help them with some of their problems. We think that by the simple fact of working with General Motors, Ford, and Chrysler alone we have been able to cut oil down 5,000 gallons a day. We have worked with companies like Ternstedt, Budd, Marathon Oil, Cadillac Motor Livonia Plant, and we, of course, took care of a portion of the Scott Paper Company wastes -- that is the mill wastes -- ten million gallons a day. We are taking care of Ford Motor Company's phenols, and I would like to comment on the aspects of this, because we have been asked many questions about whether we think industry should get tax relief for their pollution control facilities. We do not think that it is necessary in our area, in that we indirectly provide such relief for them.

We build the facility for them to the extent that their wastes are compatible and can be handled in our system, and if it is something more exotic than that why, of course, they have to partly refine it themselves before they put it in the system. It has many advantages.

We have had good cooperation from industry for one major reason, and that is there are just not enough good technicians in the area to do the job. You could visualize what would happen if we tried to enforce the law in a true sense, for every company that would discharge or could discharge would have to have its own technicians and we wouldn't have them in agreement in the place if there were that many available. This way we are the agency that provides what the standards have to be, and we have the ample law on the books, and we have the control, and we have found that rather than act like policemen, rather acting like businessmen with these people, the cooperation has been very good. We have saved them money, and we think we have saved us money, and we have gradually brought it around so we think we have control of what is developing for our system; whereas, prior to this time, we took what came in.

Now, I could talk in great detail about all of the factors. There is a map showing on each report the basic system; where the interceptors are going and what the area is that we serve.

I would, however, like to read part of my statement here on inflation effect.

Originally it was estimated, in 1966, that it would cost approximately $104 million to build regional interceptors and to complete the first phase of modernizing our existent plant. There have been delays in providing financing aid. Money from the $335 million state bond issue (approved by a two-to-one vote in Michigan last November 1968) will be available after the bonds are sold this fall. The amounts of Federal funds are still indefinite.

Mr. Stein, this is for your benefit: A lot of noise was made by the Federal officials to get programs approved; laws were put on the books to help with up to 55 percent of the financing, and now when the time comes to "appropriate," these same Federal officials are strangely quiet. If the rules of financing changed at the local level as often as they do at the Federal level, nothing would ever be built. Every year we delay the costs become greater. Inflation has raised the $104 million 1966 cost figure to $159 million.

I refer to the State bond issue which Mr. Frost commented on, and do not want to be repetitive, but we are going ahead with the program. As you would guess, we are having a great deal of trouble, because when you appropriate for this type of work and get State, local, and Federal approvals, that you expect out of $160 million that you would have to finance somewhere in the range of $32 million rather than $80 million. To get up to $80 million creates quite a considerable problem, particularly when you consider that the local areas are just as hard pressed for money as they are on the Federal level, and there is further factors here now that since certain agencies -- and again I point to the Federal level -- have not done their part. The local officials are beginning to think it isn't a sincere effort, and they are beginning to reach for our money to use for other purposes.

So, as a final statement, I would just like to point out that I urge you people, the Conferees here, to see if we can't have made available to us some of the funds that the laws are on the books for. It is very difficult to extend an area program when everybody doesn't put their share of the money in the pot.

In summation, I am reporting to you that we have adopted our treatment process for the metropolitan Detroit area; we have construction for improved treatment and expansion under way; and we have $80 million worth of contracts to award this calendar year -- probably I should say $11 million already awarded -- but I strongly recommend that more be done to finance the Federal Government's commitments lest the systematic development of this metropolitan program fail.

(Following is the complete report of Gerald J. Remus as if read into the record.)

G. J. Remus

MR. REMUS: One year ago, on June 4, 1968, I reported in detail on each facet of Detroit's Metropolitan Pollution Control Program. Today I am here to explain the progress we have made in the current year. A copy of last year's report is also being presented for reference purposes.

The Detroit regional wastewater disposal system presently serves approximately three million persons living in fifty-four communities including Detroit, and service contracts have been consummated with seventeen others and construction is under way to provide service. Negotiations with over a dozen other adjacent communities are in process. The Wastewater Plant processes an average of over 700 million gallons of sewage per day now, and this load is gradually increasing.

ADVANCED TREATMENT AT WASTEWATER PLANT

I. Pilot Plant - Test Facility

Last year we outlined some of the objectives of the 200 GPM test facility (pilot plant) installed at the Wastewater Plant as a Demonstration Project. There was Federal participation of $300,000 on this facility. This pilot plant has been in operation on almost a continuously varying schedule of tests to help us provide the best answer to the treatment of Detroit's wastes. There have been some 67,400 tests in 674 days thus far to provide needed information on sizes, processes, chemicals, et cetera, which will be used in the new plant.

A major problem was the development of a feasible process for removal of 80 percent of the total phosphate in the wastewater, as required by the stipulation of the Michigan Water Resources Commission. The early tests quickly showed that the activated sludge process (aeration) did not have satisfactory capability of consistently removing phosphate without use of chemical additives. Detroit has available large supplies of pickle liquor from Detroit's various steel plants which provided large supplies of ferrous chloride, some of which was being wasted to the river. It was learned through several months of testing that the pickle liquor would provide the necessary 80 percent phosphate removal, particularly when blended into the flow of the primary tanks.

It has now been concluded that the treatment process will be a combination of the activated sludge process, step feed modification, and chemical precipitation of the phosphate using steel pickle liquor (ferrous chloride) and further that the final design of the aeration tanks incorporate the flexibility of the pilot plant so that efficiency and economy can be obtained through the full range of quality and quantity variations that will occur in the area's system.

We have learned from the operation of the test facility that the new plant must:

1. Provide flexibility of operation because of variations in the sewage due to new wastes, daily or seasonal variations.

2. Provide a plan for easy expansion of the plant to allow for an increase in quantity or loading of the influent.

3. Provide flexibility to vary the process in order to lower operating costs.

It is planned to operate the test facility as a continuing research facility to keep us acquainted with the variations in the type of wastes we must treat, to study the possibilities of changes in process, to study the variations in loading and to investigate the value of improved treatment methods.

II. Plant Expansion - Advanced Treatment

1. Site Acquisition

Within the past year we have acquired some 27 acres adjacent to our present plant to permit expansion of the plant and to have room for secondary treatment.

G. J. Remus

Practically all buildings have been removed. We are in the process of formally closing the streets so that the properties can be used as a site for the secondary plant. This site acquisition and area clearance has cost the Detroit Metropolitan Water Services approximately $2.5 million to date.

2. Plant Expansion

The following construction contracts in the expanded plant are in process:

Contract No.		Contract Amount
PC-212	Outfall Diffuser	$ 72,150
PC-215	Plant Tunnels	*
PC-204	Vacuum Filtration Improvements	$ 553,930
PC-205	Vacuum Filtration Improvements	$ 108,389
PC-219	Two Additional Primary Tanks	*
PC-222	Four Final Sedimentation Tanks	**
PC-223	Four Additional Sludge Filters	**
PC-224	Incinerator Alterations	**
PC-220	Primary Effluent Conduit	*
PC-225	Steam Generating Units	**
	Railroad Relocations	**
	Intermediate Lift Station	**
	Biological Treatment Facilities	**
PC-228	Pickle Liquor Facilities	$ 374,500

G. J. Remus

* Contracts ready for advertising.

** Contracts to be advertised late 1969 or early 1970.

There are thus four contracts already awarded in 1969 for the plant expansion, totaling $1,108,969, and three other contracts are substantially completed, ready for advertising. Others will be completed later in the year.

III. Regional Interceptor System

We are committed to the concept of a regional system of interceptors to bring the wastewaters of Wayne, Oakland and Macomb Counties to our regional plant. This is in accordance with both the Federal and State recommendations of a single regional plant rather than many scattered smaller plants.

We had done preliminary planning prior to 1968, covering routes and sizes of interceptors needed. As plans have been completed, we have advertised and let bids on these interceptors as fast as they are in contract form.

The key contracts in this interceptor system are as follows:

G. J. Remus

Contract No.		Contract Amount
PCI-3	Preliminary Borings Along Interceptor Route	$ 79,963.75
PCI-4	Northeast Sewage Pumping Station Outlet	*
PCI-5, 6 & 7	Corridor Interceptor	*
PCI-8	Oakland-Macomb Interceptor	$4,665,000.00
PCI-9 & 10	Oakland-Macomb Interceptor	*
PC-216	Northeast Sewage Pumping Station	$4,579,608.00
PC-227	Northeast Sewage Pumping Station - Pumping Units	$ 440,862.00
PCI-15	15 Mile Road Interceptor	$3,200,000.00
PCI-11, 12, 13 & 14	Oakland-Macomb Interceptor - Other Arms	*

* Contracts ready for advertising in late 1969 or early 1970.

Five contracts have already been let totaling $16,765,434. The balance of the contracts will be ready late this year or early in 1970.

STORM OVERFLOW STUDIES

We are making a study of combined sewer overflow with a system of monitoring and with remote control of the storm and sanitary pump system on a Demonstration Grant from the Federal Water Pollution Control Administration in the amount of $2,113,000. We have just completed installation of 13 telemetering rain gages, 66 sewer level gages in combined sewers, 37 gages in interceptor sewers, 71 overflow indicators at backwater gates or dams, and remote control equipment to operate two sanitary and five storm pumping stations by remote control. The equipment is all installed and is being checked and adjusted. Remote operation of the storm and sanitary stations is already accomplished.

This system is aimed at reducing combined sewer overflow from the runoff from the smaller (most polluted) storms by practice of storm anticipation, early pumpdown and "in-system" storage. This study is continuing as a demonstration project to aid in the reduction of pollution from combined sewer overflows.

INDUSTRIAL POLLUTION PREVENTION

All industries in the metropolitan area served by the Detroit regional wastewater disposal system discharge their industrial wastes into the sewer system. A concentrated effort has been made, and will be continued, to elimiate wastes that are untreatable in our system and to control variables as much as possible so that a more adequate and uniform job of treating at the plant can be done. Six full-time and ten part-time employees are assigned to this work. There have been over 606 company contacts made and more than 1800 analyses have been completed.

Our industrial waste control policy is to work cooperatively with industry toward the solving of our mutual problems. Industries have responded and have proceeded voluntarily to correct their problems. Before the end of 1969, Chrysler will have three oil pre-treatment plants on stream and Chevrolet will have one in operation within a few months. This will remove more than 5,000 gallons of oil per day from our sewers. Extensive in-plant industrial waste surveys have been made and construction either started or designed by Detroit Diesel Engine Division of GMC, Ford Livonia Plant, Cadillac Motor, Budd Company, Marathon Oil and others. The Ternstedt Division of General Motors has installed a plating waste treatment plant.

The Scott Paper Company has completed its construction and has met all stipulations for pollution control by putting most of its plant's waste into the Detroit disposal system. Scott Paper Company's average waste load is 10 million gallons per day; and the daily revenue amounts to approximately $310.

We are presently taking Ford Motor Company's phenols and are doing construction whereby all of the

Great Lakes Steel Division's pickling acids will be utilized in our process.

There are several motivating factors that help assure industry's cooperation. Technicians are not available in numbers or with the experience for this massive pollution prevention effort. We provide this advice to the industries that discharge their wastes into the public system; in addition they get technical advice when improvements are planned. Legal actions are less prevalent, and after all, court actions withhold sewage system construction. And all customers, especially industrial, in a way, get tax relief since we build the greater portion of the pollution prevention facilities they need.

A new ordinance governing the limits for industrial discharges to the sewers is being developed.

INFLATION EFFECTS

Originally it was estimated, in 1966, that it would cost approximately $104 million to build regional interceptors and to complete the first phase of modernizing our existent plant. There have been delays in providing financing aid. Money from the $335 million State bond issue (approved by a 2-to-1 vote in Michigan last November 1968) will be available after the bonds are sold this fall. The amounts of Federal funds are still indefinite. A lot of noise was made by the Federal officials to get programs approved; laws were put on the books to help with up to 55 percent of the financing, and now when the time comes to "appropriate," these same Federal officials are strangely quiet. If the rules of financing changed at the local level as often as they do at the Federal level, nothing would ever be built. Every year we delay the costs become greater. Inflation has raised the $104 million 1966 cost figure to $159 million.

The rules governing the State bond issue grant program have been adopted and we were notified on June 25, 1969, that we are to receive $44,982,300 for our Pollution Control Program for 1969. Coupled with the Department financing, we will be able to get $80 million worth of construction under way this calendar year. We are prepared to do this, but complications are developing in the financing arena. The very fact that the Federal Government has legislation on the books for 55 percent of grant money, and has given approximately five percent, has established in the minds of the local political leaders that the Federal Government is really not sincere in financing pollution control. The result of this is that the Departmental moneys, that were approved and which we have accumulated over the last couple of years to pay for our portion of the financing, are in trouble locally in that other serious demands of the central city have caused our local political leaders to look at our funds for other purposes.

It is imperative that stronger recommendations and more financing be developed, in accordance with promises made by the Federal Government, lest our entire program come to a halt. At the present time, the amount of Federal money we have been able to get is more than eaten up by inflation due to delays that we have encountered in getting these grants.

In summation, I am reporting to you that we have adopted our treatment process for the metropolitan Detroit area; we have construction for improved treatment and expansion under way; and we have $80 million worth of contracts to award this calendar year; but I strongly recommend that more be done to finance the Federal Government commitments lest the systematic development of this metropolitan program fail.

This small map which is attached will help you to visualize the Detroit sewage collection system.

(The map above-referred to follows.)

A

CITY OF DETROIT

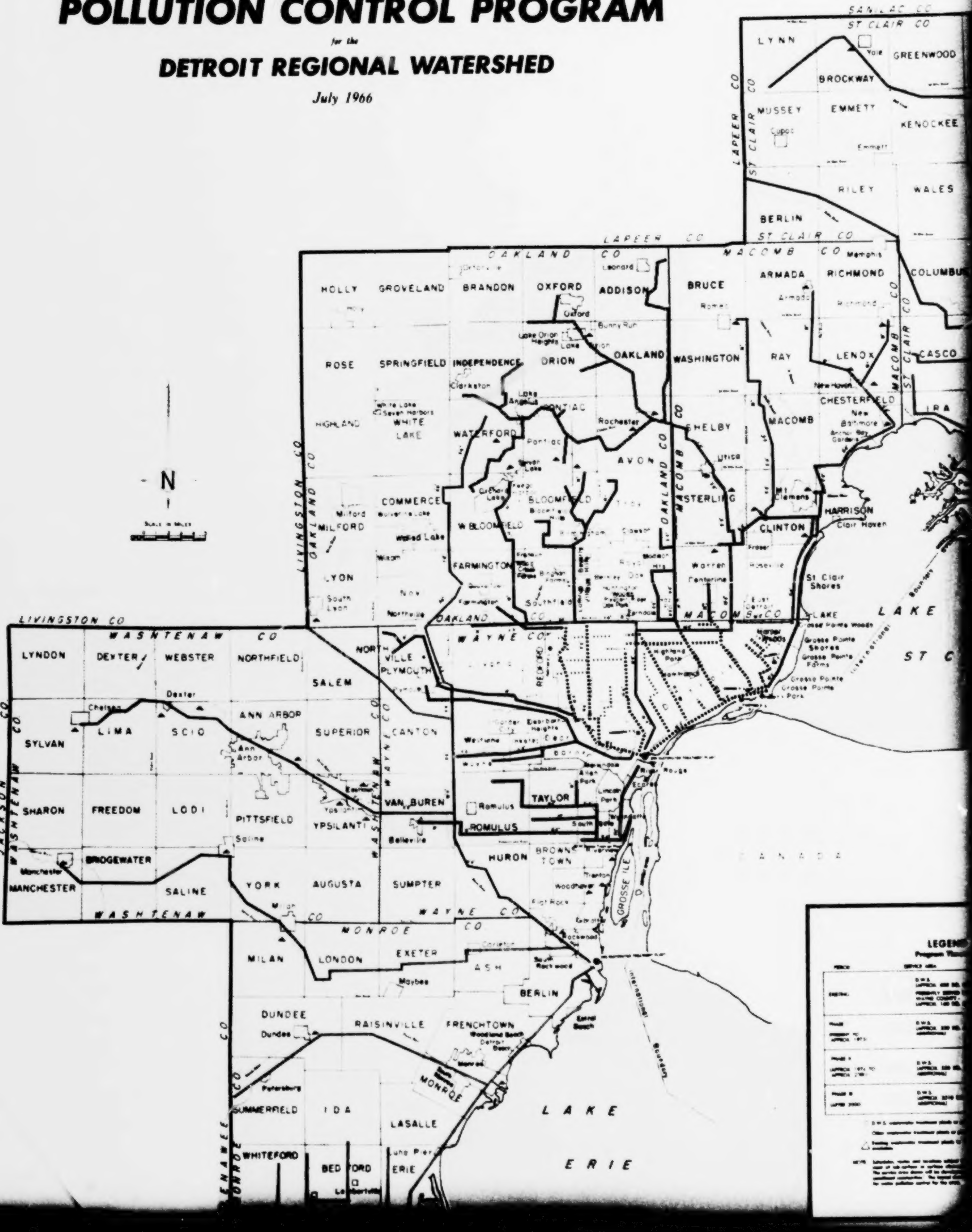
DEPARTMENT OF WATER SUPPLY

POLLUTION CONTROL PROGRAM

for the

DETROIT REGIONAL WATERSHED

July 1966



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BERLIN
OAKLAND CO
MACOMB CO
HOLLY
GROVELAND
BRANDON
OXFORD
ADDISON
BRUCE
ARMADA
RICHMOND
COLUMBUS
Leonard
Oxford
Romeo
Armada
Richmond
Bunny Run
Lake Orion Heights
Lake Orion
ROSE
SPRINGFIELD
INDEPENDENCE
ORION
OAKLAND
WASHINGTON
RAY
LENOX
CASCO
Clarkston
New Haven
White Lake
Seven Harbors
HIGHLAND
WHITE LAKE
Lake Angelus
PONTIAC
Rochester
SHELBY
MACOMB
CHESTERFIELD
IRA
New Baltimore
Anchor Bay Gardens
WATERFORD
Pontiac
Sylvan Lake
Utica
AVON
Orchard Lake
Keego Harbor
BLOOMFIELD
TROY
STERLING
Mt Clemens
HARRISON
Clair Haven
LIVINGSTON CO
COMMERCE
Milford
Wolverine Lake
Walled Lake
MILFORD
W BLOOMFIELD
Bloomfield Hills
Birmingham
Clawson
CLINTON
Fraser
Roseville
Wixom
FARMINGTON
Franklin
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Bingham Farms
Royal Oak
Madison Hts
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Centerline
St Clair Shores
LYON
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Berkley
South Lyon
Northville
Southfield
Huntington Woods
Pleasant Ridge
Ferndale
East Detroit
LAKE
Grosse Pointe Woods
Harper Woods
LAKE ST C
International Boundary
LIVINGSTON CO
WASHTENAW CO
WAYNE CO
LYNDON
DEXTER
WEBSTER
NORTHFIELD
NORTHVILLE
PLYMOUTH
Livonia
REDFORD
Highland Park
Hamtramck
Grosse Pointe Shores
Grosse Pointe Farms
Grosse Pointe
Grosse Pointe Park
SALEM
Plymouth
Chelsea
Dexter
SYLVAN
LIMA
SCIO
ANN ARBOR
SUPERIOR
CANTON
Garden City
Dearborn Heights
Dearborn
Westland
Inkster
Ann Arbor
River Rouge
Ecorse
Allen Park
Lincoln Park
SHARON
FREEDOM
LODI
PITTSFIELD
YPSILANTI
VAN BUREN
Romulus
TAYLOR
Ypsilanti
ROMULUS
Wyandotte
South Gate
Saline
Belleville
JACKSON CO
BRIDGEWATER
Manchester
HURON
BROWNSTOWN
Riverview
MANCHESTER
SALINE
YORK
AUGUSTA
SUMPTER
Trenton
Woodhaven
Flat Rock
GROSSE ILE
Gibraltar
Rockwood
CANADA
Milan
MONROE CO
MILAN
LONDON
EXETER
ASH
Carleton
South Rockwood
Maybee
BERLIN
International Boundary
Estral Beach
DUNDEE
Dundee
RAISINVILLE
FRENCHTOWN
Woodland Beach
Detroit Beach
Monroe
MONROE
Petersburg
SUMMERFIELD
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LASALLE
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ERIE
LENAWEE CO
MONROE CO
WHITEFORD
BEDFORD
ERIE
Luna Pier
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CITY OF DETROIT

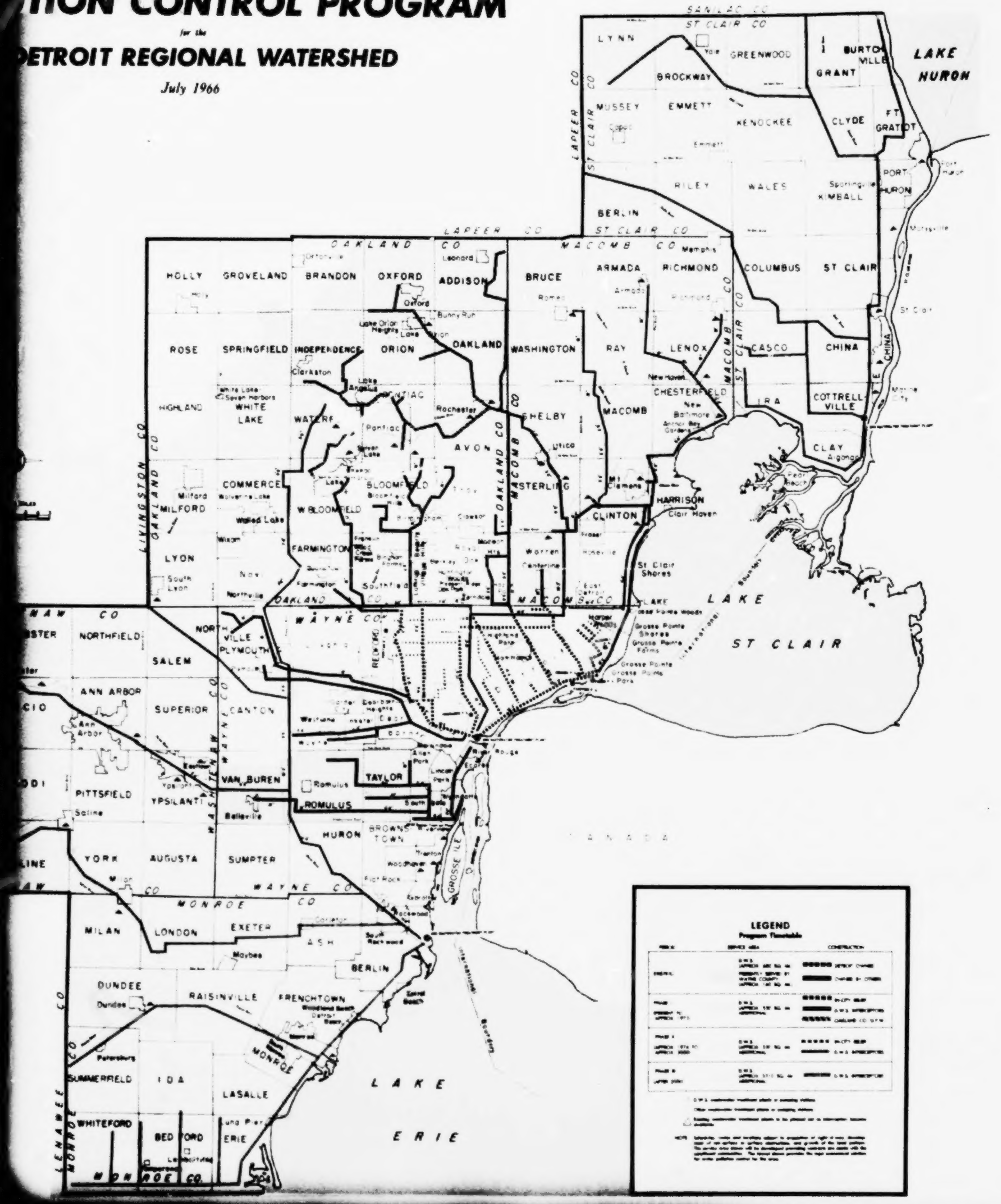
DEPARTMENT OF WATER SUPPLY

TION CONTROL PROGRAM

for the

ETROIT REGIONAL WATERSHED

July 1966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WALES
KIMBALL
PORT HURON
BERLIN
OAKLAND CO
MACOMB CO
HOLLY
GROVELAND
BRANDON
OXFORD
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COLUMBUS
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WHITE LAKE
WATERFORD
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WAYNE CO
NORTHFIELD
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PLYMOUTH
SALEM
ANN ARBOR
SUPERIOR
CANTON
VAN BUREN
TAYLOR
ROMULUS
PITTSFIELD
YPSILANTI
HURON
BROWNSTOWN
YORK
AUGUSTA
SUMPTER
GROSSE ILE
CANADA
MONROE CO
MILAN
LONDON
EXETER
ASH
BERLIN
DUNDEE
RAISINVILLE
FRENCHTOWN
MONROE
SUMMERFIELD
IDA
LASALLE
WHITEFORD
BEDFORD
ERIE
LENAWEE CO
LAKE ERIE
LEGEND
Program Timetable

City of Detroit
DETROIT METROPOLITAN WATER SERVICES
WATER BOARD BUILDING
735 RANDOLPH STREET
DETROIT, MICHIGAN 48226
962-5550

GERALD J. REMUS
General Manager

June 4, 1968

Conferees on Interstate Lake Erie
Federal-State Pollution Abatement Program

Gentlemen:

Detroit has approved an areawide program for pollution control.

The program has been formally approved by the City of Detroit. The areawide concept has been approved by four counties, under consideration by two more, and also has formal approval by the Regional Plan Agency.

Stipulations on treatment have been formally agreed to and approved by the Michigan State Water Resources Commission.

Improvement in Lake Erie could be shown much quicker if the Federal government stabilized its position on financing. The State participation program is up for vote by the public this fall, and good support is expected in that no opposition groups have expressed themselves.

Progress is being made on all facets of the pollution problem, and the report attached briefly explains this progress.

Very truly yours,

G Remus

G. Remus
General Manager

Attachment

DETROIT METROPOLITAN WATER SERVICES

WATER POLLUTION CONTROL PROGRAM

For the
Detroit Regional Watershed

PROGRESS REPORT

June 4, 1968

by

G. Remus, General Manager

DETROIT METROPOLITAN WATER SERVICES
WATER POLLUTION CONTROL PROGRAM
PROGRESS REPORT

Presented herein is a brief summary of progress to date by the Detroit Metropolitan Water Services on its Detroit Regional Watershed Pollution Control Program launched in September 1966.

The Detroit Metropolitan Water Services' (DMWS) Wastewater Disposal System currently serves approximately 3,000,000 persons living in fifty-four (54) communities, including Detroit. The System's service area is presently about 360 square miles. The DMWS Wastewater Plant processes an average of 700 million gallons of sewage per day.

I. Wastewater Plant

A. Advanced Treatment

1. Test Facility

Expenditures to date - $558,713.67

a. Demonstration Project

With the assistance of a $300,000 Federal Grant offer, a 200 gpm advanced treatment test facility has been constructed and placed in operation. The activated sludge portion was placed in service in September 1967 and the trickling filter portion in May 1968. Federal participation in the Project is scheduled to continue until December 1969. Project operating costs for the next 18 months are estimated at $200,000.

The primary objective of the test facility operation is to obtain proven design information for an economically feasible process for removal and/or reduction of suspended solids, B.O.D., phenol, oils, bacteria and 80% of the incoming dissolved orthophosphates in accordance with our May 19, 1966, Stipulation Agreement with the Michigan Water Resources Commission.

I. A. 1. a. Demonstration Project (Continued)

Other objectives are to determine: the comparative economics of the activated sludge and trickling filter processes; the suitability of various sludge disposal methods for phosphate removal; and the development of practical uses for industrial wastes.

The variety of tests conducted to date on activated sludge without chemical additives have not demonstrated any potential for consistent phosphate removal, especially insofar as the dissolved ortho-phosphate fraction is concerned. Total phosphate removals were generally about 50%, but the dissolved fraction showed bleedback tendencies.

Detroit is one of the World's centers of the metal working industry and for many years, we have known that when a slug of ferrous iron appeared in the wastewater at the plant, the phosphate content dropped to a low level. Laboratory studies were made using various iron salts, and it was learned that waste ferrous chloride from the steel industry, some of which is being discharged into the River, is very effective in removing phosphate from Detroit wastewater. Accordingly, the use of pickle liquor for phosphate removal was made part of the Demonstration Project.

Pickling liquor (ferrous chloride) has been added to the wastewater in a pilot activated sludge process for approximately two months. The indications are that better than 80% of the total phosphate is being removed. The final effluent concentration of ortho-phosphate is from 0.4 to 0.7 mg/l of P. This does not meet our stipulation of 80% removal of ortho-phosphate;

1. A. 1. a. Demonstration Project (Continued)

however, the incoming ortho-phosphate is extremely low, averaging from 1.1 to 2.0 mg/l of P. This makes an 80% removal much more difficult to obtain.

In the final analysis, it is the phosphorous content of the effluent that really matters -- not the per cent removal. Therefore, if the waste pickle liquor treatment process were to be incorporated into the plant design, a two-fold objective would be accomplished.

(1) Lake Erie would be deprived of most of the phosphates from the municipal plant and

(2) Industry would not be compelled to develop and construct treatment devices for their waste pickle liquor.

With or without pickling liquor, the activated sludge process has demonstrated the capability of consistent high removals or reduction of suspended solids, B.O.D., and T.O.C.

The plastic media trickling filter is in the "shakedown" stage. No data of consequence has been obtained during the first month of operation.

Phenol reduction continues to be studied and analyzed.

Dewatering and incineration of the waste sludge (primary and activated) will be under study and analysis in the near future.

b. Deep Tank Aeration

Due to ever-increasing population densities and housing needs in urban areas, it is known that every effort will have to be made to expand vertically as well as laterally in the future -- and this concept applies to wastewater plants as well.

I. A. 1. b. Deep Tank Aeration (Continued)

Therefore one of the 25-ft. deep sludge holding tanks is being temporarily converted to a demonstration aeration tank to study the feasibility of using shallow submergence aeration systems on tanks of depths of 30' or more.

The equipment for this test is installed and ready for operation.

2. Allied Activities

a. Detergent and Soap Industry

At a recent meeting of the Industry/Government Joint Task Force on Eutrophication Research at the Detroit Wastewater Treatment Plant, where they reviewed our pollution control program and our pilot research plant for phosphate removal, the detergent and soap manufacturers stated that they were searching diligently for a substitute for phosphate in detergents.

3. Future Construction

Within approximately one year, it is expected that sufficient design and cost information will have been derived to enable proceeding with the design and construction of the first segments of the advanced treatment facilities. It is probable the method will involve a chemical-biological process.

Provided that 55% Federal and 25% State grant assistance is forthcoming in sufficient volume at an early date, the first full-scale segment may have a capacity of 100 to 200 cfs. and may cost approximately $70,000,000 for biological-chemical treatment tanks, final settling tanks, pumping facilities, discharge and chlorination

1. A. 3. Future Construction (Continued)

conduits, and sludge disposal facilities. Upon satisfactory operation of the initial units for approximately two years, other segments would be added to bring the advanced treatment capacity up to plant load requirements.

B. Expansion

Due to enlargement of the service area of the system, higher per capita water usage and interception of a greater percentage of storm runoff, it will be necessary to not only provide advanced treatment but to expand the basic capacity of the treatment works.

1. Site

We are in the process of acquiring approximately 27 Acres of adjoining residential area to add to our present 72 Acre site. Approximately 80% of the properties have already been acquired by negotiated purchase and demolition is in progress. Acquisition costs are estimated at $2,500,000.

2. Construction

Tunnels, conduits, primary tanks, vacuum filters and incinerators are being added to increase the basic capacity of the plant by approximately one-third.

Approximately $2,000,000 of work is under construction and another $0.5 million will be under construction prior to June 30, 1968.

An application for 55% and 25% State grant funds has been filed for approximately $35,000,000 of expansion and improvement work to start prior to June 30, 1969. Included in the work is the installation of two fly ash collectors, which when installed will provide for 100% air pollution control from all incinerators.

I. C. Product Reuse

Due to the ready availability and economy of purified Great Lakes Waters, there is currently no market for primary effluent nor is there expected to be any market for secondary effluent.

However, in addition to the effluent, a wastewater plant produces two other waste products -- namely, hot exhaust gases and ash (or filter cake).

The exhaust gases are cleaned with a wet scrubber, and this hot scrubber water is now processed through an in-plant system for plant housekeeping, filter cleaning and scum processing.

Pilot plant studies have been made by a cement company (Peerless Division of American Cement Corporation) and others using Detroit's sewage filter cake (or incinerator ash) with powerhouse fly ash to produce a light-weight aggregate. The product produced is of superior quality. The cement company is seriously considering manufacturing this product because there is a tremendous market for light-weight aggregate. There is also the possibility that sewage sludges can be used in place of filter cake in a rotary kiln.

D. Design Progress

Approximately $300,000 has been expended to date for engineering and technical services (exclusive of test facility) toward design of required treatment plant facilities.

1. Outfall diffuser - Contract bids opened.
2. Plant tunnels(raw and settled flow) - Contract documents complete.
3. Screenings Disposal - under construction.
4. Primary tanks (2 ea.) - design approximately 30% complete, including soil borings.

I. D. Design Progress (Continued)

5. Scum disposal - alternate processes investigated. Preliminary layouts prepared.

6. Sludge disposal - alternate processes investigated. Preliminary drawings prepared for vacuum filtration, incineration and pneumatic ash disposal.

7. Intermediate lift station - alternate layouts prepared.

8. Biological process - site arrangement plans prepared.

9. Final settling tanks - scale model tests completed. Preliminary plans in process of being prepared.

10. Chlorine contact chamber and effluent conduit - preliminary plans prepared.

11. Rouge Outfall - scale model built. Hydraulic testing started.

12. Heating and Ventilating - cost studies prepared.

13. Electrical and Instrumentation - studies underway.

14. Site improvements - preliminary planning underway.

II. Combined Sewer Overflow Control

With the assistance of a $1,000,000 Federal Grant offer, DMWS is currently constructing a $2,113,000 sewer system monitoring and remote control network as a Demonstration Project for improving combined sewer overflow quality. Other work to improve the system is also proceeding concurrently without Federal financial assistance.

A. Objectives

The storm overflows from the system are tributary to the Detroit and Rouge Rivers. There are approximately 70 points where overflow could occur. Presently the exact number of spills, their duration and volume and the quality thereof are not known.

The primary objective of this Project is to reduce stream pollution from combined sewer overflows by reducing the number and duration of spills and by controlling the quality of that portion which of necessity must be spilled during heavy rainstorms. This is to be accomplished by practising storm anticipation and thereby in effect gaining additional temporary storm water "storage" or retention in the system. The plan is to lower the liquid level (hydraulic gradient) to the maximum degree possible by coordinated pumpdowns at the Wastewater Plant and sanitary pumping stations prior to a storm and to hold the level as low and as long as possible so as to intercept the first flush of the storm and as much of the entire storm as possible. To do this properly requires instantaneous knowledge of the behavior of the system, the storm and the characteristics of the sewage at all times.

The work consists of the furnishing and installation of liquid level sensing devices at numerous locations throughout the system, proximity switches on all backwater gates and diversion devices to denote open or closed position, rainfall intensity and accumulation gauges at numerous

II. A. Objectives (Continued)

locations throughout the metropolitan area, sewage sampling devices at critical locations, remote controlled sluice gates at several locations for flow manipulation and throttling, flow measurement devices, remote control switch gear at the pumping stations and the control center as well as all related electrical, mechanical and structural work. The work also includes operation of the sewage disposal system to maximize pollution control and maintenance of the equipment installed under this project.

The second objective of the Project is to collect data on the behavior of flow in the sewer and interceptor system which will aid in the design of more adequate sewers and interceptor systems in the future.

The work will include analysis of samples, interpretation of data, mathematical computations, establishment of emperical formulas for use in computer programming, and other work required to prepare the information for use in future designs.

B. Construction

1. System Monitoring and Remote Control

The monitoring equipment and data logger for the initial phase of the Project have been delivered and are being installed. It is anticipated that one year will be required to complete the installation and place the system in initial operation.

A contract for the furnishing and installation of power driven regulator gates and "sluicing gates" has been advertised. It is anticipated that this work will also be completed within one year.

II. B. 1. System Monitoring and Remote Control (Continued)

A program of sewage sample collection (manual) and analysis has been in operation for some time. The sample collection-analysis program is providing background information on the quality and characteristics of various combined sewer outfalls.

Automatic sampling apparatus is in the process of being procured to enable initiation of a 24-hour sampling program. Vehicles (3) have also been ordered to provide transportation for the sample collection crews.

2. Additions and Improvements to the Sewerage System

a. Dolson Backwater Gates (work completed)

Project Cost - $78,190 (33% Federal)

In our continuing program to protect the interceptor system from flooding out from high river levels, backwater gates were added to a sewer outlet on the Rouge River south of Schoolcraft Road.

b. Leib and Helen Regulator Additions and Improvements (work completed)

Project Cost - $213,322 (33% Federal)

To accommodate increased loads emanating from Oakland County through the Dequindre Road Interceptor, the capacity of the Leib Regulator on the Detroit River was doubled.

To make the Helen regulator more responsive to available Detroit River Interceptor capacity, the regulator sensing and operating system was modified and rearranged.

II. B. 2. c. Oakwood Pumping Station

Project Cost - $105,131.86 (33% Federal)

Twenty-five percent more sanitary pumping capacity is being added to the Oakwood Pumping Station. The pumps are scheduled to be in service in November 1968.

Due to the station's proximity to nearby oil refineries along the Rouge River, a neoprene belt type oil skimmer has been added to the pumping station wet well. Startup testing is underway.

d. Belle Isle (work completed)

Project Cost - $268,053 (33% Federal)

All sanitary wastes from Belle Isle are now pumped to the mainland for treatment. The existing Belle Isle Treatment Plant has been modified and converted to a storm water retention and treatment facility.

e. Sewer Program

A program of constructing additions, improvements, replacements and modifications to the system of laterals, trunk sewers and storm relief sewers is being performed at the rate of several million dollars per year.

C. Operation

1. Present

a. Regulator Surveillance and Adjustment

All regulators and backwater gates are inspected and serviced regularly and after every storm by a four-man crew.

II. C. 1. a. Regulator Surveillance and Adjustment (Continued)

Regulator float settings have been reviewed and field adjustments made where required to optimize utilization of all available interceptor capacity by present operation methods.

b. Preventive Maintenance Inspection

The condition of the interior of the Detroit River Interceptor, the combined sewer overflow outfalls and some major combined sewers is being inspected preparatory to formulating a renovation program to complement other work to be performed toward control of combined sewer overflows.

c. Related Activities

Studies and reports of others such as those of the U.S. Army Corps of Engineers, the Federal Water Pollution Control Administration, and the American Society of Civil Engineers are being reviewed for information relative to quality of combined sewer overflow, storm drainage and rainfall as it pertains to the local situation.

2. Future

a. Following completion of the installation of the System Monitoring and Remote Control Network, much of the surveillance and operation of the system will be conducted from a central location.

As more knowledge of the system behavior is derived through subsequent operation, many of the operating functions will be adapted to direct computer control.

Quality collection, analysis and control will be mechanized to the maximum possible degree.

III. Regional Interceptor System

Currently, DMWS serves all or portions of 54 communities in Wayne, Oakland, and Macomb Counties.

A. Service Area Expansion

The long range objective of DMWS is to provide wastewater disposal service for all of Wayne, Oakland, Macomb, Monroe, Washtenaw and St. Clair Counties in an orderly and systematic manner.

Of immediate concern is the provision of wastewater interceptor facilities for the Clinton River drainage basin. This service is essential for the following reasons:

(1) The waste load on the Clinton River must be reduced to protect our Belle Isle water supply intake.

(2) The region (and nation) will benefit from single unified administration and operation of all pollution control efforts in the region.

(3) The area will financially benefit from the economy of large scale operations.

Accordingly, DMWS has signed service agreements for all of Macomb County and all except the westerly portions of Oakland County.

Communities to which service is to be extended initially are:

Macomb County	Oakland County
Chesterfield Township	Avon Township
Clinton Township	Orion Township
Fraser	Pontiac Township
Harrison Township	Waterford Township
Macomb Township	West Bloomfield Township
Sterling Township	
Utica	

III. A. Service Area Expansion (Continued)

Currently, DMWS is negotiating for initial service to three other communities in Macomb County -- Mt. Clemens, Shelby Township, and Warren. It is also expected that several other communities from Oakland County will soon be incorporated into the initial phase of the program.

DMWS has had preliminary discussions with Livingston, Washtenaw and Monroe Counties relative to service by the proposed Huron River-Hannan Road Interceptor System. Preliminary studies indicate that this system would serve the remaining portions of Oakland County (except that area outside the drainage basin), portions of Livingston County, all of Washtenaw County, the remaining portions of Wayne County not presently served by DMWS, and portions of Lenawee County.

B. Construction Program

Approximately $65,000,000 is to be expended in the next two years for the initial construction of the Oakland-Macomb Interceptor System. Soil boring and aerial photogrammetric data are currently being collected. The basic design of the System has been completed.

C. Future Construction

The design of the North Interceptor, the major outlet for the Oakland-Macomb Interceptor System and other systems in Oakland and Macomb Counties, is in the developmental stage. Preliminary cost estimates for this facility indicate an expenditure of approximately $60,000,000. This facility is expected to be in operation before 1975.

A preliminary estimate indicates that at least $200,000,000 would be required for construction of portions of the Huron River-Hannan Road Interceptor System, including the Huron River Regional Wastewater Plant, in the next 20 to 25 years.

IV. Industrial Waste Control

A. Scope

The policy of the Detroit Metropolitan Water Services is to work cooperatively with industry toward the solution of our mutual problems.

The following numbers of companies which discharge to our sewer system have been contacted:

Oil Survey	- 297
Acid Usage	- 142
Heat Treating Industry	- 12
Pharmaceutical Industry	- 2
Fried Foods Industry	- 8
Total Personal Visits	- 113
Total Companies Contacted	- 574

Of those contacted the following have instituted major treatment facilities:

General Motors Corporation	Chrysler Corporation
Ternstedt Division	Mound Road Engine Plant
Chevrolet Gear & Axle Plant	Eldon Avenue Axle Plant
Chevrolet Bumper Plant	Detroit Universal Plant

Industrial waste control installations, now operating or being built by private industry in the Detroit area and whose effluent enters our system, represent a cost of over $8,000,000. All of these operations have been voluntary and were instituted by industry after the nature of our industrial waste control problem was made clear.

In addition, the following companies have made extensive surveys and are studying methods for the best ways of treating their effluent:

General Motors Corporation

Detroit Diesel Engine Division
Cadillac Motor Car Division

McLouth Steel Corporation

Ford Motor Company

Livonia Plant

IV. A. Scope (Continued)

DMWS is actively working with Ford Motor Company to solve their phenol discharge problem. DMWS has also arranged for the Scott Paper Company plant to discharge the paper mill waste into our system.

In our oil survey, it was found that 27 companies reported 71.5% of the unaccounted for oil. Accordingly, our waste oil problem is one of getting these large contributors to remove this waste oil from their effluent.

Personal visits have been made by our staff to 63 plants. It is estimated that 50 additional companies have been visited for reasons apart from the above-mentioned industry surveys.

Thus, a total of 574 companies have been contacted with respect to the control of industrial waste. From this list of contacts, there has evolved a hard core roster of chronic contributors of acid and oil. We are actively working with the large oil contributors and we make a continuing survey of the acid contribution of the companies whose records are poor in this respect.

B. Proposed Follow-up

Liquid wastes generated in the Detroit Metropolitan Area are influenced by the fact that Detroit is the automotive center of the world. This concentration of the metalworking industry contributes oil, acid and heavy metals out of proportion to the population when compared with other American cities. Major sources of these wastes have been determined, but their full evaluation remains to be accomplished. Contacts with Detroit industries have revealed a paucity of effluent data. Expressed interest of Detroit Metropolitan Water Services has already resulted in effluent surveys and others are

IV. B. Proposed Follow-up (Continued)

being planned. Several of the industries have requested assistance of the Industrial Wastes Control Unit in the organization and conduct of these surveys. This follow-up work is considered a most important element in the successful prosecution of the Industrial Wastes Control Program of Detroit Metropolitan Water Services.

C. Forthcoming Work

1. Continue conferences with industry and extend into suburban areas.
2. Maintain an organized follow-up on pollution abatement programs with those industries known to create significant liquid wastes.
3. Collaborate with industry in the conduct of comprehensive industrial waste surveys in an effort to characterize wastes and to determine respective volumes.
4. Develop an effective industrial effluent monitoring system in cooperation with industry.
5. Accumulate data to serve as basis for developing industrial waste surcharge schedules.
6. Coordinate industrial waste findings with pilot plant investigational research at Detroit Wastewater Treatment Plant.
7. Revise "Standards and Regulations Controlling the Discharge of Industrial or Commercial Type Wastes into the Detroit Sewer System."

V. Community Action

A. Keep Detroit Beautiful Committee

The Mayor's Keep Detroit Beautiful Committee has launched a vigorous campaign this Spring to enlist the help of all citizens in keeping our streets and alleys free of litter and dirt. A recent study by our Department reveals that the dirt and debris which washes off the roads into the combined sewer system has a costly impact upon those we serve.

B. United Automobile Workers

The U.A.W. has been of invaluable assistance in alerting the people of this area to the problems and costs of pollution control and in striving for the necessary legislation and funding.

C. Marinas and Boats

Recent State legislation on the control of waste and litter involving boats and marinas has prompted preliminary design work on sanitary waste disposal facilities for the City-owned marinas. Such facilities are to be in operation by 1970. The Province of Ontario has passed laws similar to Michigan's for the control of pollution from pleasure boats.

D. City Departments and Agencies

A unified and expanded street and alley clean-up program was recently initiated by the major city departments. This will materially reduce the solids flushed into the combined sewer system during a storm.

MR. STEIN: Thank you, Mr. Remus, for, as usual, a very excellent and detailed statement, on your situation in Detroit and the progress that is being made toward meeting the commitments.

Are there any comments or questions now about Detroit?

MR. PURDY: I have one.

MR. STEIN: Mr. Purdy.

MR. PURDY: Mr. Remus, there exists a stipulation or an agreement between the Water Resources Commission and the city of Detroit that contains specific effluent restrictions.

When this was entered into, and on the basis of what appeared to be financing that would be available at that time, it was thought that you could reach the stipulated effluent requirements by November of 1970.

In your report here, you have noted the scheduling of biological treatment facilities for either 1969 or 1970, and I believe it will be 1970. Do you now have a date that you could give the Conferees, based upon what you conceive in the way of financing, for the completion of the facilities that will meet the effluent requirements that we have agreed upon?

MR. REMUS: We will be very happy to settle for Mr. Frost's statment of 1972.

MR. PURDY: Is this your schedule now?

MR. REMUS: No, we still feel that we are obligated -- and this is a local feeling as well as Water Board feeling -- I am talking about the local political leaders -- we said in November of 1970 that we would get this work that was stipulated complete.

That, of course, is improbable -- impossible now, but I think that we are entitled to add to that date the amount of money -- the amount of time we lose here in this period of time waiting for this financing to materialize, which is roughly a little better than a year.

MR. PURDY: So you would say you are looking at a schedule now of roughly November of 1971?

MR. REMUS: That is correct.

MR. STEIN: Are there any other comments or questions?

MR. PURDY: I have one more.

Now, you mentioned that --

MR. REMUS: I would like, Mr. Purdy, to make it very clear, however, that there are still some complications in this financing.

I put the statement in here that the State bond money would be available by this fall. We are going ahead to the extent that we have our half of that construction money available. But should -- I am talking about the year that -- the time we lost of when we should have been done -- November 1968 to whenever this money becomes available is the time I'd like to add onto that 1970 date.

MR. PURDY: I prefaced my question that the original schedule is based upon financing that appeared would be available at that time. Now, it didn't turn out to be available when you thought it would.

MR. REMUS: That is correct.

MR. PURDY: And now based upon the financing that appears will be available, you are looking at a November 1971 date.

MR. REMUS: That is substantially it, although I am still betting that part of this money will be available from the State this coming summer. That is the only hangup we have here.

MR. PURDY: Yes.

Now, in your statement on phosphate removal, you mentioned that the treatment facility will produce an effluent -- in your case you start out with a low total phosphorus content of the sewage as compared to what you might expect. And so it is rather difficult to reach the 80 percent level, but you end up with an effluent, you said, less than two milligrams per liter, or two parts per million. How much less?

MR. REMUS: No, if I said it that way, I misspoke.

We intend to reach the 80 percent level, but what I am saying is that I don't like the 80 percent factor because 80 percent on sewage that has seven parts per million against 80 percent on sewage that has 12 parts per million puts us in a different arena than others, so what we should be saying here is that we would like to reduce to 20,000 pounds per day or less which is two parts per million or less.

MR. PURDY: And this is what your pilot plant shows you could reach with activated sludge and chemical participation?

MR. REMUS: That is correct.

MR. STEIN: I was going to withhold this comment, but let me for the sake of the record make it here, since Mr. Purdy brought this up.

As you know, with this phosphate or phosphorus removal program, we were plowing new ground in Lake Erie -- in the Lake Erie abatement program. The 80 percent figure we came up with originally was a generalized figure. At the later conferences, as we began to grapple with the problems that you are facing in your city, Mr. Remus, we determined that the 80 percent would be applied to the States on a State-wide basis to estimate their poundage and reduce it.

Now, we are also getting many, many reports that it seems more realistic for any municipality running a system, and a State as a regulatory agency, possibly to examine the parts per million of phosphate in the effluent to get a reduction, and then relate that back to a computation on pounds per day in the lake so we can keep it below the critical level. I think the 80 percent is intended just also as a figure to analyze the efficacy of the complete State program and not particularly to get at every last individual industry, or municipality, or every pipe that you have, or every kind of effluent no matter how concentrated or how dilute the original phosphates were in there, and say at every one of the points in that system you have to get out 80 percent.

Now, this is something that the Conferees will take up later, but I think, in particular, Detroit with its pilot plant, in pointing out the problems in dealing with phosphate removal, has really clarified this issue and helped us sharpen up the program so we can meet it realistically.

MR. REMUS: Glad to hear you say that, because when you sold us that bill of goods we thought you were a pretty good huckster. (Laughter)

MR. STEIN: Mr. Eagle.

MR. EAGLE: Yes, I think I need a little clarification.

Mr. Remus, do I understand that you are saying here that you expect to have your secondary treatment facilities, that is your activated sludge process and chemical precipitation, completed and in operation by November 1971?

MR. REMUS: The stipulation we made was November 1970.

MR. EAGLE: Yes.

MR. REMUS: Now, Ralph used the figure 1971. I don't know as I quite agree with him, because I am adding to November 1970, the time loss until this money became available -- whatever that is.

Now, it looks as though it is a little better than a year; it may be more than that, because we do not yet have an answer to the one question, and that is to whether we can encumber contracts on the basis of the commitment that the State has made on their bond issue at this time.

If we could encumber now with that money, even though we had the former statement in Detroit, as soon as we have formal approval to sell the bonds, we can encumber. Whether this order from the Water Resources Commission allows us to do that, we don't know. Maybe we could get that answer.

MR. EAGLE: What is your estimated construction time on your secondary facilities?

MR. REMUS: About a year and a half.

MR. EAGLE: So if you started now, you would just about make it?

MR. REMUS: That is right.

MR. EAGLE: Are they already designed?

MR. REMUS: Yes.

MR. EAGLE: Design is completed.

MR. REMUS: Well, we have many of the sections under contract, and all of the basic work.

MR. EAGLE: Thank you.

MR. STEIN: Are there any further comments or questions?

Mr. Poston.

MR. POSTON: I think I have a couple of questions. I think they do bear -- they do bear on the matter of secondary treatment, and this conference's recommendations call for secondary treatment completion by November of 1970, and we have talked about this a lot here. But my question is: What date will we have full secondary treatment? And the second question: What percentage of the Detroit wastes will receive secondary treatment by the conference deadline? In other words, this November 1970 date, or 1971 date.

MR. REMUS: Well, let us use whatever the new date is. In the construction program, the activated sludge, as it was explained in last year's report, based on deep tank aeration, our design -- we are running about 700 million gallon a day there. I can't give you just how that will come about by months here now, but by the 1970 date there would be enough activated sludge to take care of substantially all of our plant, all of our intake.

MR. POSTON: Or that 700 million.

MR. REMUS: That is right.

Now, there, I have to hedge in this extent: that we are designing that on the basis of new data. We think it is all right, but there is one factor that bothers us and that is to whether we have 600 or 700 million when those sections are complete.

MR. POSTON: In other words, 700 million gallons of Detroit sewage or thereabouts, their normal flow --

MR. REMUS: That is correct.

MR. POSTON: -- would receive secondary treatment by, or activated sludge treatment by --

MR. REMUS: 1972 is the total section, and the basic section, which will take care of a good portion of this, would be done at the end of the two periods that we are talking about, and they are running together pretty close on it.

MR. POSTON: I think what I was searching for was the fact that the total flow would receive this activated sludge treatment.

MR. REMUS: Well, yes, you could say 500 million gallon on a detention time of four hours, or 600 million gallon on a detention time of five hours. That would be the type of thing that we will run into when we put the plant in service.

I would like to answer that a little bit, but I am not sure whether I would get support of the Water Resources Commission.

MR. POSTON: Well, I think you have a very difficult problem not only from devising of the treatment, but your financing, and I think the Conferees are aware of this.

MR. REMUS: Well, that is the reason that I emphasize once again the financing, because it isn't Detroit alone, it is the metropolitan Detroit that takes care of better than 40 percent of the State's population. And, as such, what we are doing is: it requires that we agree on a system, that we agree on a method of financing, a method of contract, and that we do that. But you are not dealing with just one community, you have got the whole situation, and that is where this Federal financing has thrown us a real curve not only the fact that the money didn't come through but the changes that are always considered.

MR. STEIN: Are there any other comments or questions?

MR. LYON: Mr. Chairman, I think there is one point that couldn't be emphasized enough here. I wonder whether we are all realizing what Mr. Remus is really doing for cleaning up Lake Erie. He could, for example, if he wanted to, just stick with the problem of Detroit and the immediate suburbs to Detroit, but he has developed a plan that includes many of the surrounding counties, so he is really including many problems that are not normally those of Detroit. I think it is this kind of leadership that we need in our metropolitan areas, because what he is really doing is taking on the problems of many other areas surrounding Detroit. It is that kind of leadership that will really help us remove the phosphate pollution from one if not the major source of phosphate pollution in Lake Erie. I think he really should be commended for the fine job he is doing.

MR. REMUS: Well, thank you, but I have had a lot of help.

MR. STEIN: This is true, and before we get into this comment, we will give Mr. Remus a chance to answer the comment. I would also like to say that, as always, we get pure and unvarnished reports from Mr. Remus on precisely what is happening in Detroit, and my experience is: they can be relied upon down to the letter, with no puffing or optimistic statements.

But I would like to get back to this financing business, the Federal financing. I know this may be a theme that we are going to have all through this conference about the notion about the Federal people being quiet now.

I think the problem stems back to a very, very essential provision in our Constitution -- that probably one of the reasons we have the Constitution is that the Federal Government has to maintain an Army and Navy and provide for the common defense.

Now, if Detroit, as well as taking on the water and sewer problems of the metropolitan area up there, possibly would also have the job of taking on the handling of the Vietnam War, I would guess that they might have to change their financing schedule in Detroit, too.

MR. REMUS: I would like to, Mr. Stein, sum up the questions that were asked me so they don't get out of focus.

The question was asked about the year and a half. That means that is when the shovel starts going; that is not a bunch of preliminary conversation and financing involvement. It also means -- the question Mr. Poston asked -- about full control -- that has got some financing in there, because you see we were organized to pay for 20 percent of the whole cost. We now have to pay for 50 percent. That second part is only in part offered locally. The first part was covered locally as far as we were concerned. So there are three handles to this, as there always are: the getting the contracts and the construction design, and I think it is far enough along that I am safe in saying that we have a lot of work that could go -- in fact, I mentioned we awarded some contracts just a week ago Monday -- a week ago last Monday, yes -- but to answer these questions individually puts them a little out of focus. They all hang together is what I am saying.

MR. STEIN: Thank you. Are there any other comments or questions?

If not, thank you very much for your contribution, Mr. Remus.

MR. REMUS: You are welcome.

MR. PURDY: I have a couple of questions.

MR. STEIN: Yes.

MR. PURDY: Is Mr. Jim O'Keefe in the audience?

I have a request from Mr. Pandowski that a representative from the UAW be given a chance to make a statement.

Is Mrs. Irene Fink or a representative of the Lake Erie Cleanup Committee present?

I guess that completes it, Mr. Stein.

MR. STEIN: Thank you, Mr. Purdy.

Let's go to New York now. Mr. Metzler.

MR. METZLER: The New York statement will be given by Mr. Eugene Seebald, who is the Associate Director for the Division of Pure Waters, the organizational unit in New York which is responsible for carrying out the pollution abatement program.

MR. STEIN: Let me announce: we are purposely not taking a break. We usually do take a morning break, but in view of the Friday afternoon transportation situation, and the problem of getting started a little late, we want to push this forward as rapidly as possible so we can get out as early as possible.

Would you go ahead, sir?

STATEMENT OF EUGENE F. SEEBALD, ASSOCIATE
DIRECTOR, DIVISION OF PURE WATERS, NEW YORK
STATE DEPARTMENT OF HEALTH, BUFFALO, NEW YORK

MR. SEEBALD: I would like to announce, Mr. Chairman, that Mr. Mount Pleasant, I believe, has passed out the Appendix 1 and 2, to which I have referred in the text of the statement, which I request be entered as if read.

MR. STEIN: Without objection, this will be done.

MR. SEEBALD: The following resume will illustrate the status of the program in New York State in water pollution control as it affects Lake Erie water quality.

As in the past only those discharges having a significant effect directly or indirectly through Lake Erie tributaries from the Buffalo River to the New York-Pennsylvania State line, inclusive, will be discussed. Comments will also be made regarding New York State's current program involving previous conference recommendations.

Enforcement Status

As of June 1, 1969, 14 of the 41 previously tabulated sources discharging into or affecting Lake Erie are considered abated, inactive or insignificant. Of the remaining 27 unabated discharges, 18 are now under Commissioner's orders and nine are under voluntary schedules. A total of 11 entities are considered as progressing unsatisfactory due, principally, to attempts at conformance with regional planning as required by State and Federal statutes and policy. These are receiving continuous followup in order to achieve compliance without initiation of court action. Court action will be instigated when it becomes obvious that sincerity is lacking and progress towards compliance is nothing more than a series of delaying tactics. Specifics relating to individual projects are summarized in Appendix 1.

Since May 1965, nine municipal projects, with a total Federal eligible project cost of over $6.3 million have been completed. Currently, State grant money totaling $14.1 million is committed for eight municipal projects, having a total of State eligible cost of $27.2 million.

Initial local inertia to the implementation of comprehensive planning is being overcome. In September 1968, the Erie County Legislature adopted the sub-regional plan with certain modifications. The report prepared for Erie County by the consultants has also been accepted by the Erie-Niagara Regional Planning Board as the Erie County portion of the bi-county sewage treatment plan. Resistance to multi-municipal solutions has lessened as municipalities have had the opportunity to explore the recommendations of the consulting engineers in greater depth. The State Health Department has advised all municipalities that the comprehensive study and the recommendations thereof are to be utilized as the basic plan for sewerage facilities within Erie County, and that variations will not be considered to be in compliance with these regional plans unless sufficiently justified economically and/or technically. Non-compliance may result in ineligibility for State and Federal financial aid.

On an industrial level, much work has been accomplished towards meeting the objectives of the IJC and complying with the recommendations and conclusions established by the Conferees of the Lake Erie Enforcement Conference. Of major import is the work underway at the Bethlehem Steel Corporation in the city of Lackawanna.

At the time of this report, six permits have been issued for construction of work to treat approximately 83 million gallons per day of wastes at an estimated construction cost of $7,425,000. Of these $2.75 million worth of works has been completed. These waste treatment facilities include phenol and cyanide treatment; hot and cold bar, strip and slabbing mills wastes; and the coke oven wastes. In addition, other work still remains to be acted upon. Included in this are the blast furnace and BOD treatment facilities including the final thickener the cold mill and pickle liquor rinse water as well as the deep well disposal of the concentrated waste pickle liquor.

The Moench Tannery, Division of Brown Shoe

Corporation, located in the village of Gowanda, has completed and submitted pilot plant studies which indicate that the treatment proposed will adequately reduce load discharges presently to Cattaraugus Creek and is currently preparing final plans for the construction of full-scale facilities.

Two industrial-municipal complexes; namely, the village of Westfield and the village of Fredonia, by virtue of the small receiving waters flowing through the community, and by virtue of the large industrial waste contribution from the industries in the communities (primarily food processing), are faced with major expenditures for the adequate treatment of the wastes if the communities are to continue to receive the industrial waste jointly discharged to the sewerage systems of the communities.

The village of Westfield, in accordance with plans prepared by the consulting engineers, currently has final plans under way for the extension of their outfall directly to Lake Erie with provisions being made therein for incorporation of the treated industrial wastes if the industry decides to discharge either into the municipal system or to treat their wastes separately. The industry is currently engaged in bench scale treatability studies on the treatment of their wastes, and have engaged consultants for preparation of a feasibility report.

The village of Fredonia is preparing plans for interim solutions to their problems and have submitted a wastewater treatment facilities report which is currently being reviewed by the State Health Department.

The city of Dunkirk is completing final plans for a secondary treatment plant which also incorporates nutrient removal capability.

Status of Conference Recommendations

1. Nutrient Removal - (Policy adopted May 29, 1969)

A policy relating to nutrient removal, particularly phosphorus removal, has been developed by the State Health Department and has received public exposure through recent press releases. This policy, in essence, calls for the removal of phosphorus in the New York State Lake Erie Basin at all plants receiving flows of 1.0 mgd or greater. In addition, the total pounds of phosphorus originating from municipal and industrial sources for the total basin shall be reduced by 80 percent. For the Lake Erie Drainage Basin, immediate attainment of these objectives shall be by December 31, 1971, for all direct discharges, and by December 31, 1974, for all indirect discharges.

This policy and plan of implementation have been submitted to the Chicago Regional Office of the FWPCA as the New York State program for nutrient control.

2. Deep Well disposal - (Policy adopted May 29, 1969)

A policy governing the injection of liquid wastes by deep wells has been developed and also received public exposure via recent press releases. The Department's position is that this method of waste disposal is considered a last resort. The applicant must demonstrate that this method (1) is the optimal approach, and (2) has the least effect on the total environment. Concurrence from the Division of Oil and Gas of the Conservation Department and the Office of the State Geologist of the State Education Department must be obtained before a permit can be issued for the construction and operation of any waste disposal project using deep well injection.

3. Bathing Beach Surveillance

During the summer of 1968, 299 samples from seven recognized Erie County bathing beaches and 430 samples from ten such beaches in Chautauqua County were collected for bacteriological analyses. In Erie County, 11 or four percent of samples were greater than 5,000 MPN/100 ml and the median coliform value was 240 MPN/100 ml. In Chautauqua County, only two samples exceeded 2,400 coliforms/100 ml. These were discounted on the basis of followup sanitary surveys.

As a result of this surveillance, none of the beaches were closed last season for bacteriological reasons. Based on an evaluation of the analytical data and consideration of the method of sampling and laboratory analysis, it was concluded that:

a. Water quality at the time of sampling was, in all cases, with the exception noted, at an acceptable sanitary level, and there were no contraventions of the State water quality standards.

b. Occasional high coliform counts were not indicative of normal water quality at the beaches.

c. Presence of fecal coliform organisms in 165 out of 299 Erie County samples is judged to be a normal condition for waters considered bacteriologically safe.

The summary report is provided as Appendix 2.

4. Dredging

The Corps of Engineers' report is considered to adequately cover this aspect. Personnel from NYSDH assisted FWPCA staff in water quality surveillance in conjunction with dredging practices.

5. Oil and Gas Drilling

Public hearings have been held regarding the rules and regulations developed by the New York State Conservation Department's Division of Oil and Gas. These criteria are based on some 50 years of operational experience by the Province of Ontario and include rigid requirements covering the drilling, pumping, and refinement phases. Sub-surface investigations indicate geologically stable formations and the absence of oil deposits. In addition to the above, the contingency plan requires the posting of $1 million worth of liability insurance, $100,000 accidental spill insurance, and a $20,000 per well plugging bond.

6. Combined Storm and Sanitary Sewers

The State Health Department is currently operating under a program of elimination of combined sewerage systems and concomitant overflows where possible and feasible, or in the alternate, reducing overflowage to the practicable minimum. New sanitary sewer construction of the separate type only is being approved. Replacement of existing combined sewers is being reviewed on an individual basis. A local corrective program of surveillance and remedial construction involving administrative

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organization, engineering and fiscal planning, and action is being required incidental to any wastewater treatment plant submission. Assistance is also being given in establishing and administering effective sewer use ordinances.

7. Prevention of Spills

A contingency plan for the prevention of oil spills has been developed in the Buffalo area where representatives of State, Federal, County and City, and other agencies, have formed a task force to combat local oil problems, particularly in the vicinity of the Buffalo River. The purpose of this plan is to set general priorities of action and treatment since rapid action would be required in an emergency to minimize damage.

The city of Buffalo has received from the U. S. Federal Government a grant for over $500,000 to investigate the factors of on-stream detection, interception, analysis, removal, and disposal of oil.

In conjunction with the Federal Government's emergency control plan for reporting and coping with major spills or releases of oil or hazardous material to surface waters, the State Department of Health has the responsibility of immediately reporting major incidents that are directly or indirectly a potential threat to water quality in adjoining States, international waters, or coastal waters. Immediate reporting of incidents to proper agencies is of prime importance in enabling downstream users to institute the proper corrective or defensive action to minimize damage.

8. Elimination of Lake Front Municipal Refuse Dumps

The State of New York is pleased to report that there are no such sites on its Lake Erie waterfront.

9. Control of Deleterious Runoff

In the fall of 1968, a Commissioner's Advisory Committee on Agricultural Drainage was organized. This group is considering problems relating to air and water pollution associated with agricultural activities. They are currently preparing a report entitled, "Guides for Controlling Contaminant Emissions Released from Confinement Animal Production Farms." The Health Department is providing an input relating to potential water quality problems attendant upon agricultural drainage. It is expected that this committee will advise and coordinate applicable measures for controlling potentially adverse drainage from various agricultural operations.

10. Industrial Effluent Sampling Programs

Several industries discharging into or affecting

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water quality in Lake Erie are routinely sampling their wastes and maintaining records. These include Bethlehem Steel, Mobil Oil, Buffalo Dye Works, Donner-Hanna and Republic Steel. In addition, Moench Tannery, Eastern Tanners Glue Division, and industries in the Westfield complex are obtaining data on their waste characteristics incidental to the design of remedial waste treatment facilities.

Testing and measuring by industries involved in the Waste Outlet Registration program will commence in October 1969. This will include major industries with significant discharges at first.

The purpose of Waste Outlet Registration for the Health Department is to provide information for a pollution alert network for continuous surveillance discharges to the waters of the State and to illustrate the continuing effectiveness of pollution abatement efforts.

The industries will be required to sample and analyze for certain characteristics depending upon the nature of the manufacturing processes. The reportable characteristics selected (see attached proposed Form San. 44) reflect the potential effects on established receiving water quality standards.

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This data will be reported to Albany on an annual summary basis for compilation and storage for prompt retrieval.

11. Water Quality Surveillance Network

The original recommendations of the Conferees to the Lake Erie Enforcement Conference directed the responsibility of establishing monitoring stations in Lake Erie to the Federal Government and monitoring of tributaries to be provided by the States.

In New York State, the water quality surveillance network consists of 111 manual sampling stations including four located on tributaries to Lake Erie. These include the Buffalo River at Buffalo, the Buffalo River at Gardenville, Buttermilk Creek near Springville and Cattaraugus in Gowanda. Solicited data is received for IJC from stations in Lake Erie at Buffalo and in the Buffalo River at Buffalo. Automatic monitors are proposed for the Buffalo River at Buffalo and Buttermilk Creek at Springville. In addition, an automatic monitor will be in operation by August 1969, at the source of the Niagara River.

The manual station on Buttermilk Creek and the proposal for an automatic monitor there is the result of concern for the operation of the nuclear fuels reprocessing plant in Cattaraugus County at Ashford.

To date, the sampling analyses received have indicated relatively high ammonia and organic nitrogen in Cattaraugus Creek at Gowanda. This station is located below two major industrial plants. Results from the station established on the Buffalo River at Buffalo indicate high ammonia, phenol and chloride concentrations resulting from waste discharges into the lower Buffalo River pool. The Buttermilk Creek station samples will be analyzed for oil and chemical analysis in addition to basic radiological examinations.

12. Regional Planning

County-wide comprehensive sewerage studies for Erie and Chautauqua Counties have been completed. A similar study for Cattaraugus County is nearing completion with the study report presently under review and acceptance in the near future as anticipated. As reported previously, attempts to comply with recommendations for regional planning had initially resulted in some project delays. However, these problems are being resolved and projects are moving ahead, and it is fully anticipated that construction will result in the best overall solution, in most instances.

This concludes New York's presentation, Mr.

Eugene Seebald

Chairman.

(Appendices 1 and 2 referred to in Mr. Seebald's report follow.)

POLLUTION ABATEMENT STATUS
NEW YORK STATE DISCHARGES AFFECTING LAKE ERIE

June 1, 1969

Polluter Name	Action Required	Action Taken or Explanation	Additional Action Required
Moench Tannery* Gowanda V.	Submit preliminary plans 3/69.	Pilot plant study completed and results submitted (schedule modified).	Review of pilot plant results and preparation of final plans and construction.
Eastern Tanners Glue Div.* Gowanda V.	4/69 - Submit an approvable report - re: efficiencies of removal and amenability of wastes to treatment.	Preliminary study submitted and under review.	Submit final plans and construct WTW or modify plant operations in accordance w/consultant's recommendation.
Brocton V.*	Final plans and construction by 4/68.	Revised WWFR approved 4/69; industrial contribution eliminated.	Implementation of report.
Dunkirk C.*	Submit final plans 5/69.	Bids opened 6/16/69 on outfall; final plans under review.	None. Implementation of plans.
Westfield V.*	Commence construction 9/68.	WWFR submitted 6/68 under review; industrial waste treatment and financing problematical.	Resolve technical and fiscal problems and proceed with construction.
Growers Cooperative Westfield V.	See Welch Grape Juice - Westfield V. below		
Seneca Westfield Maid Westfield V.	See Welch Grape Juice - Westfield V. below		
Welch Grape Juice Westfield V.*	Commence construction 9/68.	Food processing industries are cooperatively studying technical & fiscal problems; industrial consultants have been retained and report due 7/69.	Follow-up on results of consultant's evaluation; proceed with selected treatment alternate.

POLLUTION ABATEMENT STATUS
(cont.)

Polluter Name	Action Required	Action Taken or Explanation	Additional Action Required
North Collins V.*	Initiate construction 6/69.	Feasibility study for No. Collins (V), No. Collins (T) and Eden (T) to connect with Erie Co. SD#2.	Implement study or provide advanced waste treatment.
Producers & Canners Coop.* No. Collins V.	Complete construction 1/69.	Negotiating with village re financing joint solution with other municipalities (see No. Collins (V)).	Implement study.
Silver Creek V.*		Abated.	Possible extension of outfall to lake.
Silver Creek Preserving Brant T.	Connect to village sewers.	Contract negotiations for connection to village sewers underway.	Connect.
Bethlehem Steel Co.* Lackawanna C.	Commence construction 6/68.	Construction underway in 10 areas varying from 10% to 90% complete; see narrative for details.	Completion of construction program.
Socony Mobil Oil* Buffalo C.	Commence construction 7/68	In-plant modifications to reduce phenol discharge; sale of facilities pending.	Effectives w/in-plant modifications on receiving water quality.
Buffalo Dye Plant* Buffalo C.	Preliminary plans 1/68.	Report submitted and approved; agreement between Allied Chem. & BSA reached re discharge of pretreated waste to BSA.	Construction of pretreatment facilities and connection to BSA by 1/71.
Depew V.*	Commence construction 6/68.	Same as Lancaster (V).	

POLLUTION ABATEMENT STATUS
(cont.)

Polluter Name	Action Required	Action Taken or Explanation	Additional Action Required
Lancaster V.*	Complete construction 6/69.	Feasibility study completed and submitted with option of connection to Buffalo Sewer Authority. Negotiation w/BSA re charges and capacity (Erie Co. SD#4-Lancaster (V) & (T)).	Prepare WWFR for ECSD #4 and Depew (V).
Donner-Hanna Coke* Buffalo C.	Commence construction 3/69.	Report submitted 2/69; in-plant modifications have been made to reduce discharges.	Report approval and implementation of recommendation therein.
Republic Steel* Buffalo C.	Submit final plans 4/69.	Final plans submitted; portions approved; construction underway.	Complete construction.
Red Wing Co.* Fredonia V.	Industry to complete construction of pretreatment facilities by 6/69; final plans for village by 9/69.	Plans for interim facilities submitted by village; in-plant modifications at Red Wing. WWFR submitted.	Revise WWFR and proceed with final plans and construction.
Ripley Sewer District Ripley T.	Preliminary report, secondary treatment due 9/69.	WWFR under preparation in compliance with time schedule.	Implementation of schedule.
Hamburg T. Master SD	Provide secondary treatment and incorporation of other existing sewer districts.	Consultants retained for secondary treatment and negotiations underway to provide additional capacity.	Provide secondary treatment.
Wanakah SD Hamburg T.	Connection to Hamburg master plant.	Consultants retained for feasibility study.	Implementation of comprehensive plan.
Woodlawn SD Hamburg T.	Same as for Wanakah SD.		

POLLUTION ABATEMENT STATUS
(cont.)

Polluter Name	Action Required	Action Taken or Explanation	Additional Action Required
Mt. Vernon SD* Hamburg T.	Preliminary plans 4/69.	See Hamburg (T) Master SD (consultants retained for feasibility study - Hamburg master connection vs. solo venture).	Connect to Hamburg Master District.
THE FOLLOWING NEW YORK INDUSTRIES HAVE ABATED THEIR POLLUTION:			
Lackawanna C. Erie Co.	Implementation of comprehensive plan, i.e. connection with Hamburg Master Plant or secondary treatment with nutrient removal.	Interim additional facilities for nutrient removal and incidental BOD and suspended solids removal utilizing existing facilities are proposed by the comprehensive study.	Implementation of interim plan.
Lawtons Hamlet* N. Collins T.		Insignificant discharge.	Will be included in town comprehensive plan.
Huntley Mfg. Co. Brocton V.		Causes local pollution; no effect on L. Erie. Connected to village sewer system.	Abated.
R. C. McAteer Ripley T.		Connected to Ripley sewers.	Abated.
Welch Grape Juice Brocton V.		Used for storage purposes only.	Abated.
Allegheny Ludlum Steel Corp. - Dunkirk C.		Connected to municipal sewers.	Abated.
Twin Cities Asphalt Dunkirk C.			Abated.
City Laundry Dunkirk C.		Connected to municipal sewers.	Abated.

POLLUTION ABATEMENT STATUS
(cont.)

Polluter Name	Action Required	Action Taken or Explanation	Additional Action Required
Hanna Furnace Co. Lackawanna C.		Minor pollutional problem.	
Growers & Packers Coop. No. Collins V.		Plant used for storage only.	**Abated.**
Dunkirk Conference Grounds - Sheridan T.			
Holy Cross Seminary			

THE FOLLOWING NEW YORK INDUSTRIES WERE LISTED IN PREVIOUS CONFERENCE PROCEEDINGS AS ADEQUATE AND ARE STILL CONSIDERED ADEQUATE:

Polluter Name	Action Required	Action Taken or Explanation	Additional Action Required
Great Lakes Printing Co. - Dunkirk C.			
General Chemical Div. (Buffalo Chemical Works) Allied Chemical Corp. Buffalo C.			
Niagara Mohawk Dunkirk C.			
Old Dutch Foods Blasdell V.			

*Under State Health Commissioner's Order.

SUMMARY REPORT
ERIE COUNTY
BATHING BEACH SURVELLIANCE PROGRAM
LAKE ERIE BEACHES
JUNE, JULY, AUGUST - 1968

ACKNOWLEDGEMENTS

Implementation of a surveillance program of this type was successful because of the contributions made by all participating personnel and agencies. The following persons and organizations were instrumental in the success of this undertaking and their cooperation is greatly appreciated:

Erie County Health Department

William E. Moser, M.D., Commissioner
David E. Barry, P.E., Deputy Commissioner for Environmental Health Services
Program Coordination - Mr. Michael Stankewich, Director of Division of Water Pollution Control
Laboratory Services - Noel R. Rose, M.D., Director; Joseph Puleo, D.V.M.M.P.H., Director of Public Health Division; and Mr. M.C. Lanighan, Senior Sanitary Chemist of Erie County Laboratory
Sample Collection - Mr. Bisone, Environmental Health Inspector

New York State Health Department - Buffalo Regional Office

LaVerne E. Campbell, M.D. - Regional Health Director
Eugene F. Seebald, P.E. - Regional Director of Public Health Engineering
Program Coordination - Mr. Anthony T. Voell, Assistant Public Health Engineer and Mr. Dennis Roesser, Summer Student Sanitarian
Data Summarization - Mr. Roesser and Mr. Jon Bender, cooperative student from Cincinnati University
Graphical Presentations - Mr. Bender and Mr. Frank Nerone, Junior Public Health Engineer

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ERIE COUNTY

LAKE ERIE BEACH SURVEILLANCE PROGRAM

SUMMER 1968

1. Introduction:

The New York State Public Health Law classifies bathing waters as follows: Section 1205-5 (c) (iii).

> "Sources of water for bathing, fishing, boating and any other usages except shell fishing for market purposes in tital salt waters: For such sources, the monthly median coliform value for one hundred ml. of sample shall not exceed two thousand four hundred from a minimum of five examinations and provided that not more than twenty percent of the samples shall exceed a coliform value of five thousand for one hundred ml. of sample and . . . . "

Because the State and Local Health Departments are charged with the responsibility of enforcing the above law, a surveillance program was conducted to insure the maintenance of acceptable water quality for bathing.

A joint effort was undertaken involving both State and County personnel for sample collection and analyses.

2. Beach Locations Sampled:

Beaches sampled and the total number of samples collected during the summer are listed on the Summary of Results sheets attached to this report.

3. Sampling Methods and Frequency:

Samples were collected at 3 feet and 6 feet depths on each beach. The number of samples collected per month ranged from 12 to 19 and the number of visits to each beach ranged from 6 - 10 per month.

4. Bacteriological Analyses:

All samples were analysed for the numbers of organisms in the coliform family and also for the presence or absence of fecal coliform organisms. The analyses for the total foliforms followed the multiple tube technique as outlined in the 12th Edition of the Standard Methods for the Examination of Water and Wastewater. The presence or absence of fecal coliform organisms was also determined although this was strictly a qualitative test and did not indicate numbers of organisms.

5. Significance of Coliform Organism as an Indicator of Pollution

A bacterial indicator of pollution is any organism which would exhibit by its presence that pollution has occurred and hopefully give some indication of its source.

The coliform organism has many properties of an ideal indicator of pollution:

A. Its application is not limited to any particular type of water.

B. Colfiroms are always present in water when pathogenic organisms eminating from cecal contamination are present.

   1. The density of coliforms present is related to the extent of fecal pollution.

   2. Survival time of coliforms is greater than that of the pathogens and they disappear rapidly following the disappearance of the pathogens.

   3. Coliforms are substantially absent in bacteriologically safe water.

C. Coliforms are harmless to man and other animals and lend themselves to routine quantitative testing procedures.

It is for these reasons that this organism is used as a measure of the bacteriological quality of a body of water.

6. Interpretation of Analytical Data

Two hundred ninety-nine samples were collected during the three-month sampling period.

Monthly median coliform results were, in all cases, less than 2,400 per 100 ml. at the seven beaches sampled. Instances were reported where individual coliform results exceeded 5,000 per 100 ml. These high bacterial counts can be attributed to any of a number of factors.

A. Stirring up of lack bottom sediments caused by winds or other sources of turbulance. Decaying organic matter on the bottom of the lake, which normally contains coliform organisms, would be disturbed and this matter put into suspension and into sampling areas.

B. Precipitation resulting in surface washing from soil which normally contains coliform organisms.

C. Storm water overflows of combined wastewater discharging into the Lake.

D. Sampling procedural errors could occur causing unusually high or low results.

Analyses for fecal coliform organisms indicated that these organisms were present in over hald of the samples analysed. This is not an entirely unexpected result because in environmental waters relatively free from recent pollution, the fecal coliform density may range commonly from 1 to 10% that of the total coliforms. More interpretation could be done if the fecal coliform data was quantitative.

7. Beach Closings During Summer:

No beach closings were reported among the seven beaches sampled. The Hamburg Town Beach was opened during the summer of 1968 but because of previous evidence of poor water quality following periods of precipitation and/or strong offshore winds certain operating conditions were set. The conditions under which this beach operated are setforth in the letter from the Erie County Health Department to the Town of Hamburg in appendix of this report.

8. Conclusions:

Based on an evaluation of the analytical data and consideration of the methods of sampling and laboratory analyses the following conclusions are drawn:

A. Water quality at the time of sampling was, in all cases, at an acceptable sanitary level and there were no violations of the State Public Health Law.

B. Periodic high coliform counts were not indicative of normal water quality at the beaches but were caused by extenuating circumstances.

C. Presence of fecal coliform organisms in 165 out of 299 samples is judged to be a normal condition for waters considered bacteriologically safe. One to ten percent of total coliforms are usually fecal coliforms as reported in the Training Course Manual - "Freshwater Biology and Pollution Biology".

9. Recommendations:

The following statements are set forth as considerations for future action.

A. Bathing beach surveillance should be continued during the summer of 1969, to present to the public assurances of water of an acceptable sanitary quality.

B. Quantitative fecal coliform tests (elevated temperature test) should be run because of the indication that these organisms are present in over half of the samples collected. High densites of fecal coliforms would be an indication of relatively recent pollution.

C. Determination of a ratio of the number of fecal coliform organisms to the number of fecal streptococci organisms would be of assistance in identifying sources of pollution. This ratio for human waste is approximately 4.5 while for other animal waste it is less 0.5.

D. Continuity should be maintained in laboratory analyses for the coliform organism. Either the multiple tube technique or the membrane filter method should be used throughout.

ATV:slr

APPENDICES

Hamburg Beach, OK to open 1968 under certain conditions

COUNTY OF ERIE
HEALTH DEPARTMENT
601 CITY HALL
BUFFALO, N. Y. 14202

WILLIAM E. MOSHER, M. D.
COMMISSIONER

October 19, 1967

Seth A. Abbott, Supervisor
Town of Hamburg
Town Hall, 501 South Park Avenue
Hamburg, New York 14075

Dear Mr. Abbott:

During the past few years we have collected frequent samples of water from the various bathing beaches in Erie County, including the one at the Hamburg Town Park.

During June 1967 we collected 11 samples, in July we collected 12 samples, and in August we collected 14 samples. Of these 37 samples, 7 samples showed most probable number of coliform bacteria of over 2400 per 100 milliliters, and 3 samples of 2400.

The high results were 110,000 after a 0.39" rain, 15,000 after a 0.54" rain, 46,000 after a 0.42" rain, 4,600 after a 0.72" rain two days previously, 24,000 after a 0.54" rain on the previous day, and 46,000 after a 0.42" rain.

It appears that high results appear during and for some time after certain rains and wind conditions.

Turbidity of the water used for swimming is also a very important factor, not only because turbidity indicates run-offs from the various polluted streams and overflows, and disturbance and mixing of the polluted areas of the lake. The water was turbid after the rains. Turbidity has to be particularly watched during bathing periods as it effects safety or effective rescue work. Part 6 of the State Sanitary Code, in connection with swimming pools, specifies that the water shall be sufficiently clear to permit a white and black object four inches in diameter placed on the bottom of the swimming pool at the deepest point, to be clearly visible from the sides of the pool.

On the basis of the mean and median of the results of the 39 samples collected during the summer of 1967, the water at Hamburg Park beach has met the State standards and we will permit it to reopen in 1968 on the following conditions:

- continued -

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1. Bathing is not to be permitted on the day of moderate to heavy rain and for 48 hours after its cessation.

2. The water in the bathing and swimming area must be clear and free of algae and floating materials during periods of bathing and swimming.

3. The sewer overflow shall be closed as it was in the summer of 1967. See Mr. William Harris, your town engineer.

4. Turbidity of the water and weather reports, days the beach is open, etc., are to be kept for every day of the summer. Our weather records are those based on the airport and sometimes are different from those in Hamburg.

5. The bathing beach shall be under the supervision of an operator or competent attendant who shall require the careful observance of sanitary regulations prescribed in the Sanitary Code and the conditions (above) of the permit. A full report of any serious accident or illness occuring shall be reported to the health department within 24 hours.

6. The bathers shall be under direct supervision of the qualified lifeguard and such lifeguard shall be present at the bathing area at all times when the bathing beach is officially open. The hours that the bathing beach is officially open, and a prohibition against swimming or bathing at any other time, shall be prominently posted.

We will inspect and collect samples in 1968 and if by some chance find the conditions unsafe for bathing, we shall so advise you.

Very truly yours,

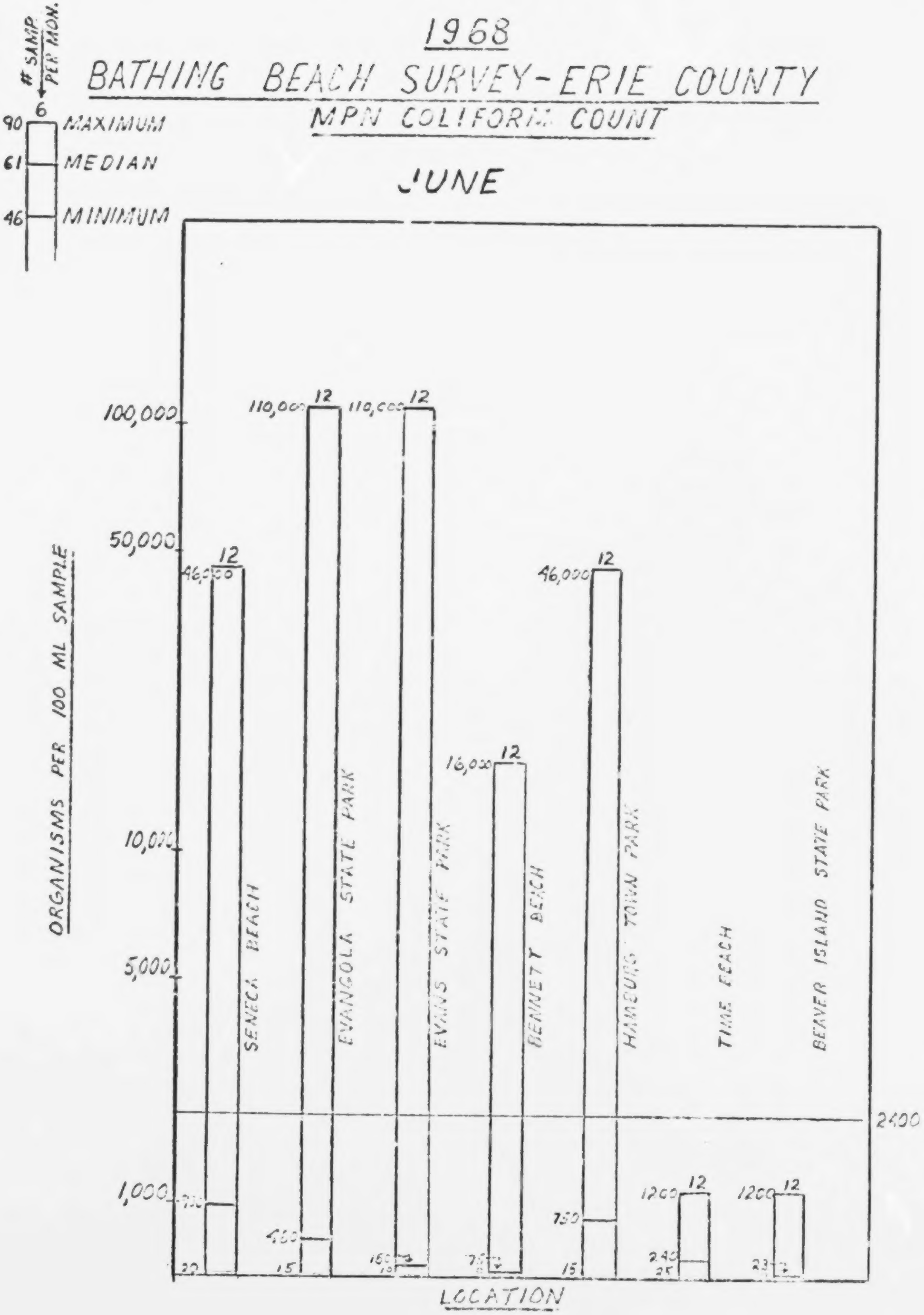
William E. Mosher, M. D.
Commissioner of Health

WEM:MJS:pp

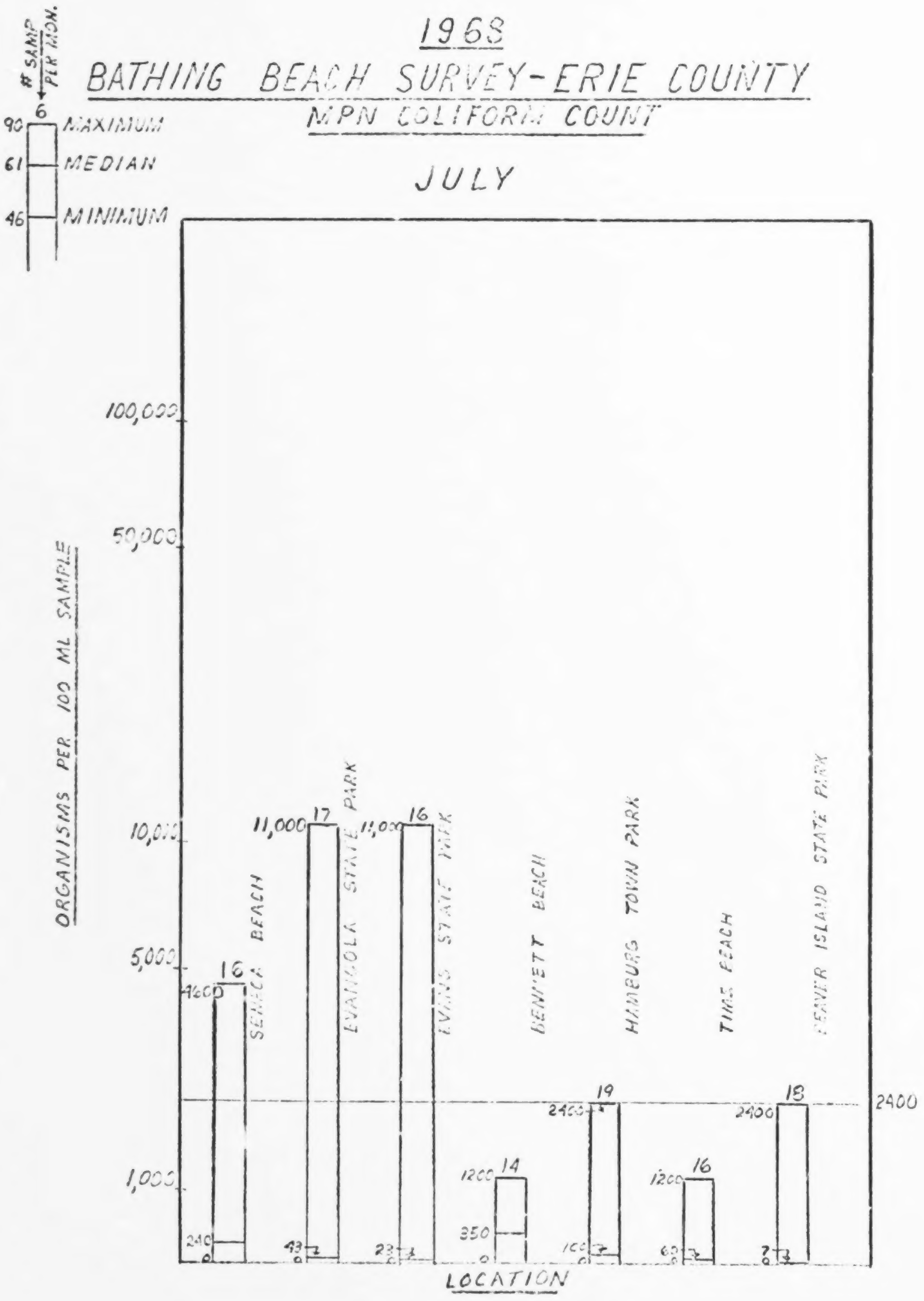
BUFFALO REGIONAL OFFICE
N. Y. STATE DEPT. OF HEALTH
MAY 31 1968
RECEIVED

- SUMMARY OF RESULTS -
ERIE COUNTY BATHING BEACH SURVEY (1968)

PLACE	JUNE					JULY					AUGUST					ENTIRE SEASON				
	NO. OF SAMPLES	NO. OF SAMPLES WITH FECAL COLI.	NO. OF SAMPLES > 5000/100 ML	% OF SAMPLES > 5000/100 ML	MEDIAN COLIFORM	NO. OF SAMPLES	NO. OF SAMPLES WITH FECAL COLI	NO. OF SAMPLES > 5000/100 ML	% OF SAMPLES > 5000/100 ML	MEDIAN COLIFORM	NO. OF SAMPLES	NO. OF SAMPLES WITH FECAL COLI.	NO. OF SAMPLES > 5000/100 ML	% OF SAMPLES > 5000/100 ML	MEDIAN COLIFORM	NO. OF SAMPLES	NO. OF SAMPLES WITH FECAL COLI.	NO. OF SAMPLES > 5000/100 ML	% OF SAMPLE > 5000/100 ML	MEDIAN COLIFORM
SENECA BEACH	12	9	1	8%	930	16	4	0	0	240	13	9	1	8%	240	41	22	2	5%	240
EVANGOLA STATE PARK	12	8	1	8%	460	17	4	1	6%	43	16	9	0	0	460	45	21	2	4%	240
EVANS TOWN PARK	12	10	1	8%	150	16	6	1	6%	23	15	10	0	0	460	43	26	2	5%	93
BENNETT BEACH	12	9	1	8%	75	14	7	1	7%	350	15	12	0	0	240	41	28	2	5%	240
HAMBURG TOWN PARK	12	8	1	8%	750	19	11	1	5%	100	15	11	1	7%	460	46	30	3	7%	240
TIMES BEACH	12	8	0	0	240	16	9	0	0	60	15	8	0	0	240	43	25	0	0	150
BEAVER IS. STATE PARK	12	4	0	0	23	18	2	0	0	7	20	7	0	0	43	50	13	0	0	13
TOTALS	84	56	5	6%	240	106	43	4	4%	60	109	66	2	2%	240	299	165	11	4%	240



1968
BATHING BEACH SURVEY-ERIE COUNTY
MPN COLIFORM COUNT
JUNE



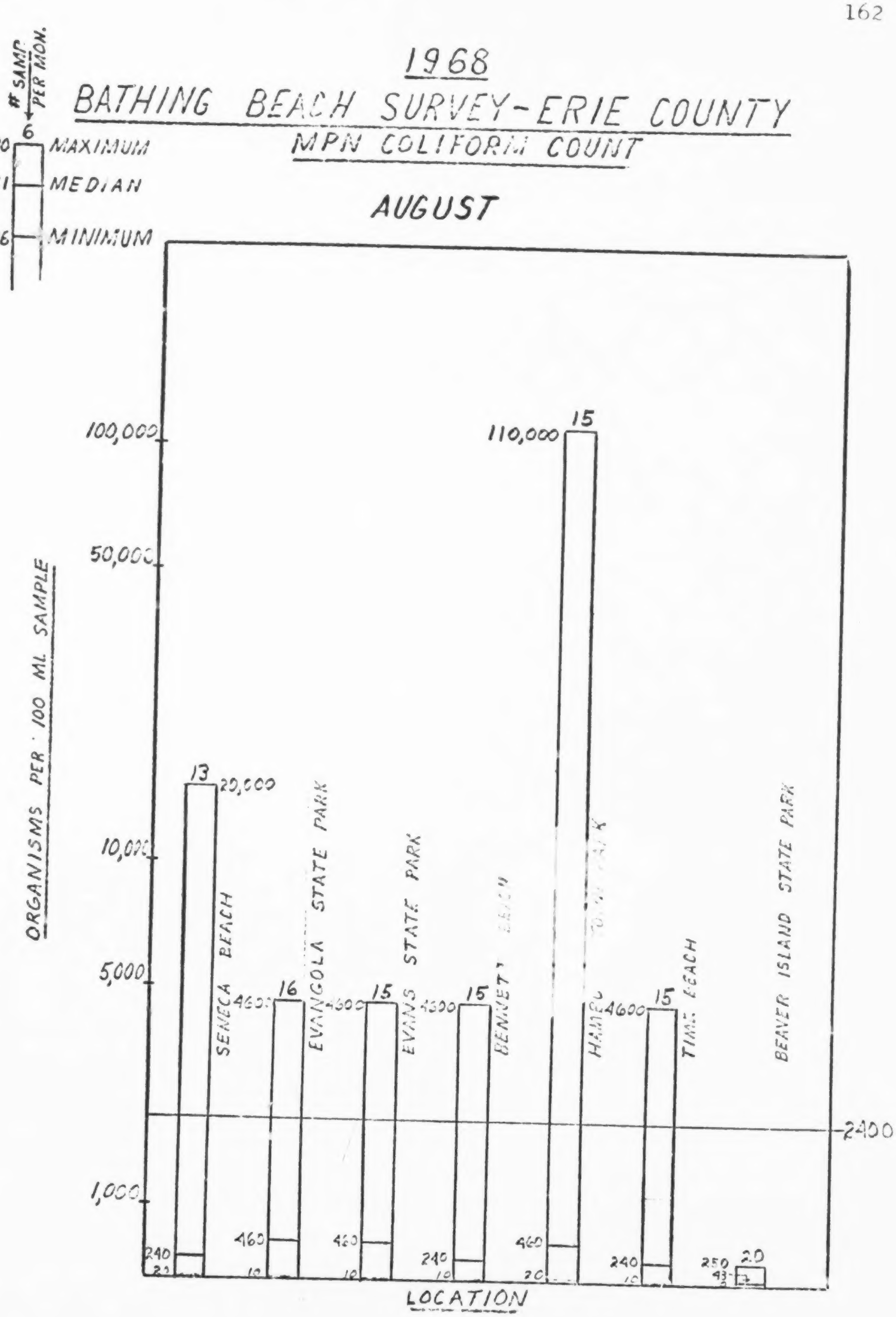
1968

BATHING BEACH SURVEY-ERIE COUNTY

MPN COLIFORM COUNT

JULY

1968
BATHING BEACH SURVEY-ERIE COUNTY
MPN COLIFORM COUNT
AUGUST



SUMMARY REPORT
CHAUTAUQUA COUNTY
BATHING BEACH SURVEILLANCE PROGRAM
JUNE, JULY, AUGUST - 1968

- SUMMARY OF RESULTS -
CHAUTAUQUA COUNTY BATHING BEACH SURVEY (1968)

PLACE	JUNE					JULY					AUGUST					ENTIRE SEASON				
	NO. OF SAMPLES	NO. OF SAMPLES WITH FECAL COLI.	NO. OF SAMPLES > 5000	% OF SAMPLES > 5000	MEDIAN COLIFORM	NO. OF SAMPLES	NO. OF SAMPLES WITH FECAL COLI.	NO. OF SAMPLES > 5000	% OF SAMPLES > 5000	MEDIAN COLIFORM	NO. OF SAMPLES	NO. OF SAMPLES WITH FECAL COLI.	NO. OF SAMPLES > 5000	% OF SAMPLES > 5000	MEDIAN COLIFORM	NO. OF SAMPLES	NO. OF SAMPLES WITH FECAL COLI.	NO. OF SAMPLES > 5000	% OF SAMPLE > 5000	MEDIAN COLIFORM
COLBURN 18C	NO		SAMPLES			NO		SAMPLES			3		0	0	1600	3		0	0	1600
STOW FERRY 19B	NO		SAMPLES			6		0	0	270	8		0	0	345	14		0	0	235
LAKE ERIE		NOT DETERMINED IN LAB					NOT DETERMINED IN LAB					NOT DETERMINED IN LAB					NOT DETERMINED IN LAB			
OLD MURRAY BEACH 24C	NO		SAMPLES			1		0	0	3360	NO		SAMPLES			1		0	0	3360
BLUE WATER 8A	4		0	0	480	5		0	0	980	NO		SAMPLES			9		0	0	800
HANOVER 41A	NO		SAMPLES			8		1	12%	520	31		0	0	1300	39		1	3%	1300
SUNSET 41B	4		0	0	550	25		3	12%	160	37		0	0	570	66		3	3%	400
SHERIDAN BAY 3AA	1		0	0	600	6		0	0	30	38		1	3%	380	45		1	2%	270

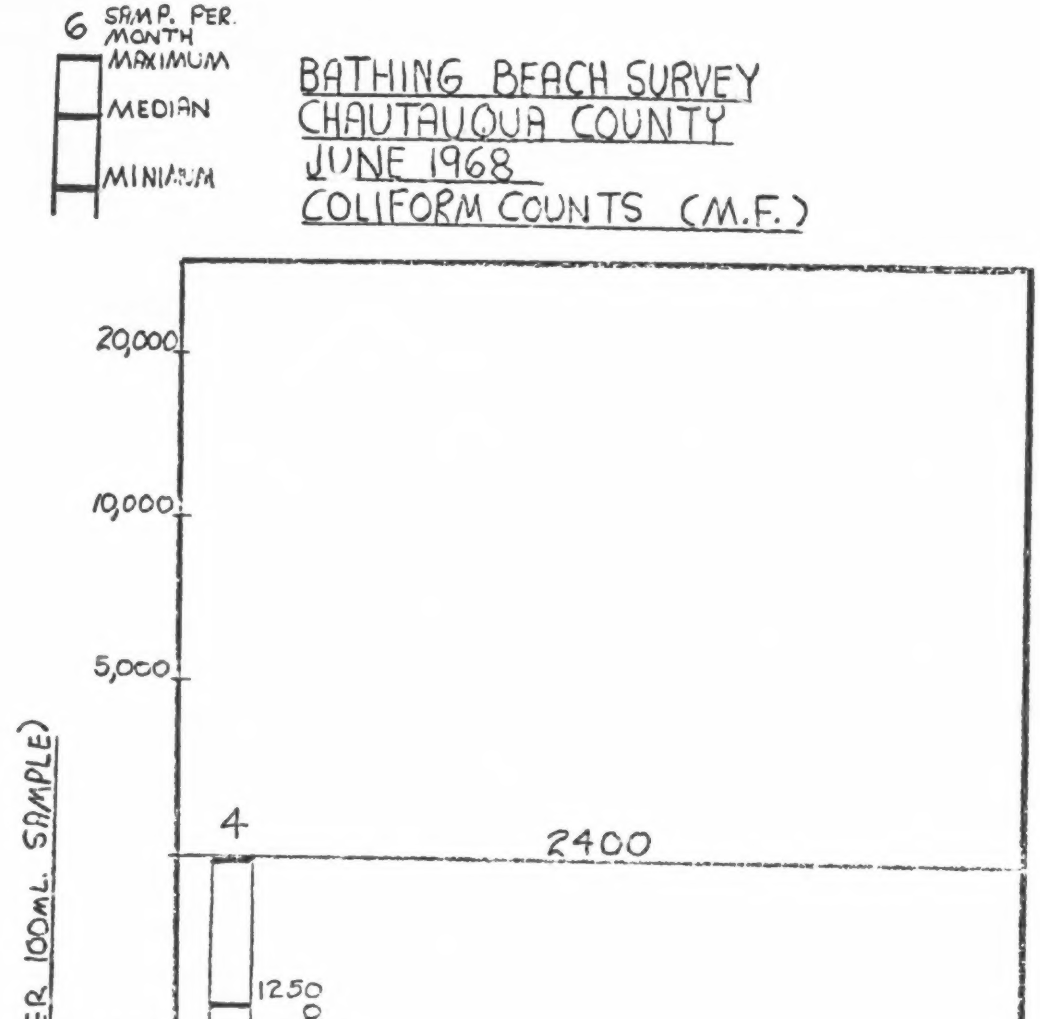
- SUMMARY OF RESULTS -
CHAUTAUQUA COUNTY BATHING BEACH SURVEY (1968)

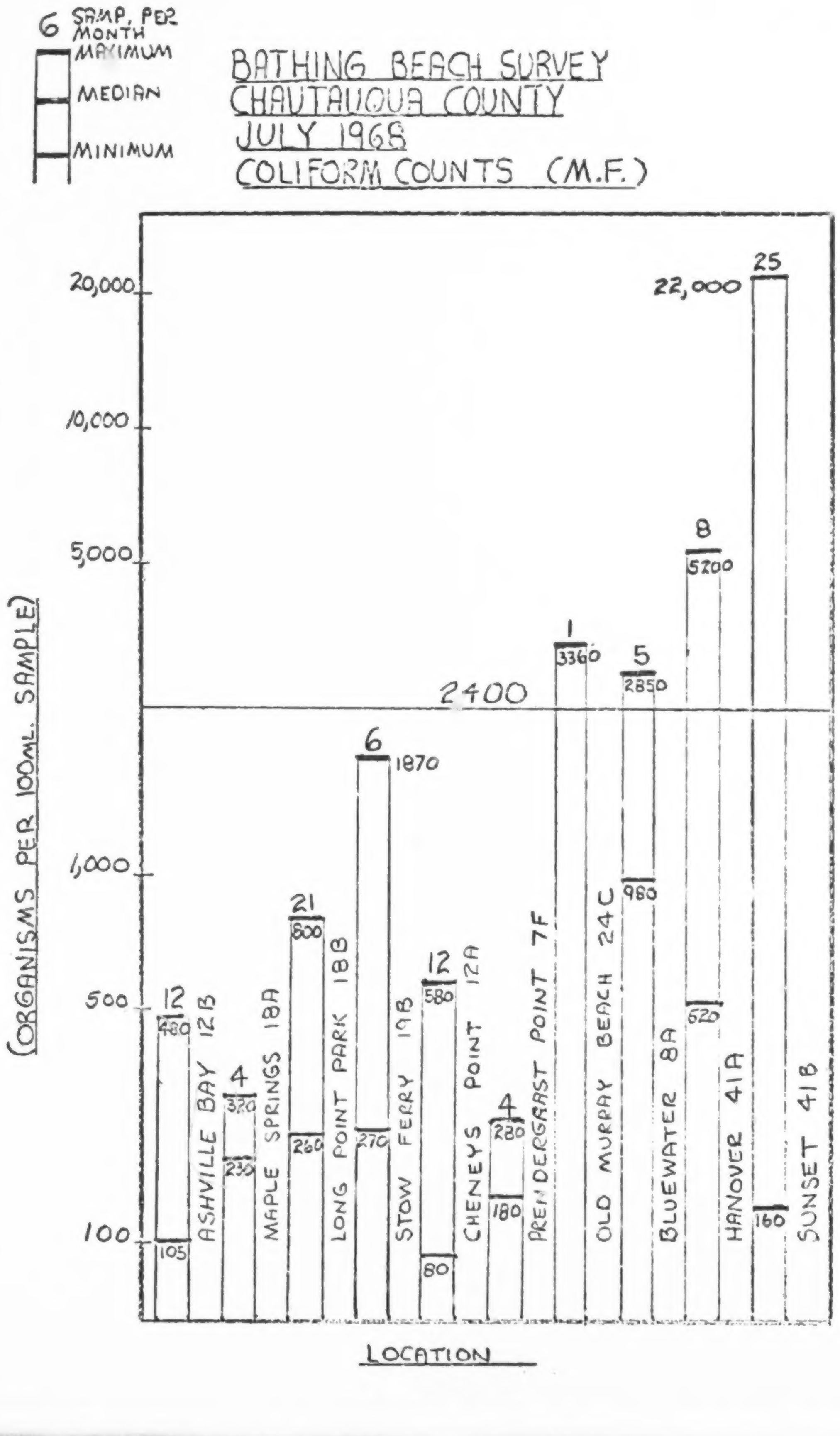
PLACE	JUNE					JULY					AUGUST					ENTIRE SEASON				
	NO. OF SAMPLES	NO. OF SAMPLES WITH FECAL COLI.	NO. OF SAMPLES > 5000	% OF SAMPLES > 5000	MEDIAN COLIFORM	NO. OF SAMPLES	NO. OF SAMPLES WITH FECAL COLI.	NO. OF SAMPLES > 5000	% OF SAMPLES > 5000	MEDIAN COLIFORM	NO. OF SAMPLES	NO. OF SAMPLES WITH FECAL COLI.	NO. OF SAMPLES > 5000	% OF SAMPLES > 5000	MEDIAN COLIFORM	NO. OF SAMPLES	NO. OF SAMPLES WITH FECAL COLI.	NO. OF SAMPLES > 5000	% OF SAMPLE > 5000	MEDIAN COLIFORM
WRIGHTS BEACH 24A	4		0	0	355	58		0	.0	210	47		0	0	610	109		0	0	400
POINT GRATIOT 24B	4		0	0	400	24		0	0	1250	48		1	2%	700	96		1	1%	620
LAKE ERIE STATE PARK 14A	4	NOT DETERMINED IN LAB	0	0	1000	12	NOT DETERMINED IN LAB	0	0	1160	10	NOT DETERMINED IN LAB	0	0	570	26	NOT DETERMINED IN LAB	0	0	1000
RIPLEY TOWN 1A	4		0	0	1250	14		0	0	560	12		0	0	2610	30		0	0	1960
OTTAWAY PARK 8B	NO		SAMPLES			11		4	36%	2480	NO		SAMPLES			11		4	36%	2480
FINDLEY LAKE 2A	8		0	0	115	10		0	0	72	5		0	0	120	23		0	0	110

- SUMMARY OF RESULTS -
CHAUTAUQUA COUNTY BATHING BEACH SURVEY (1968)

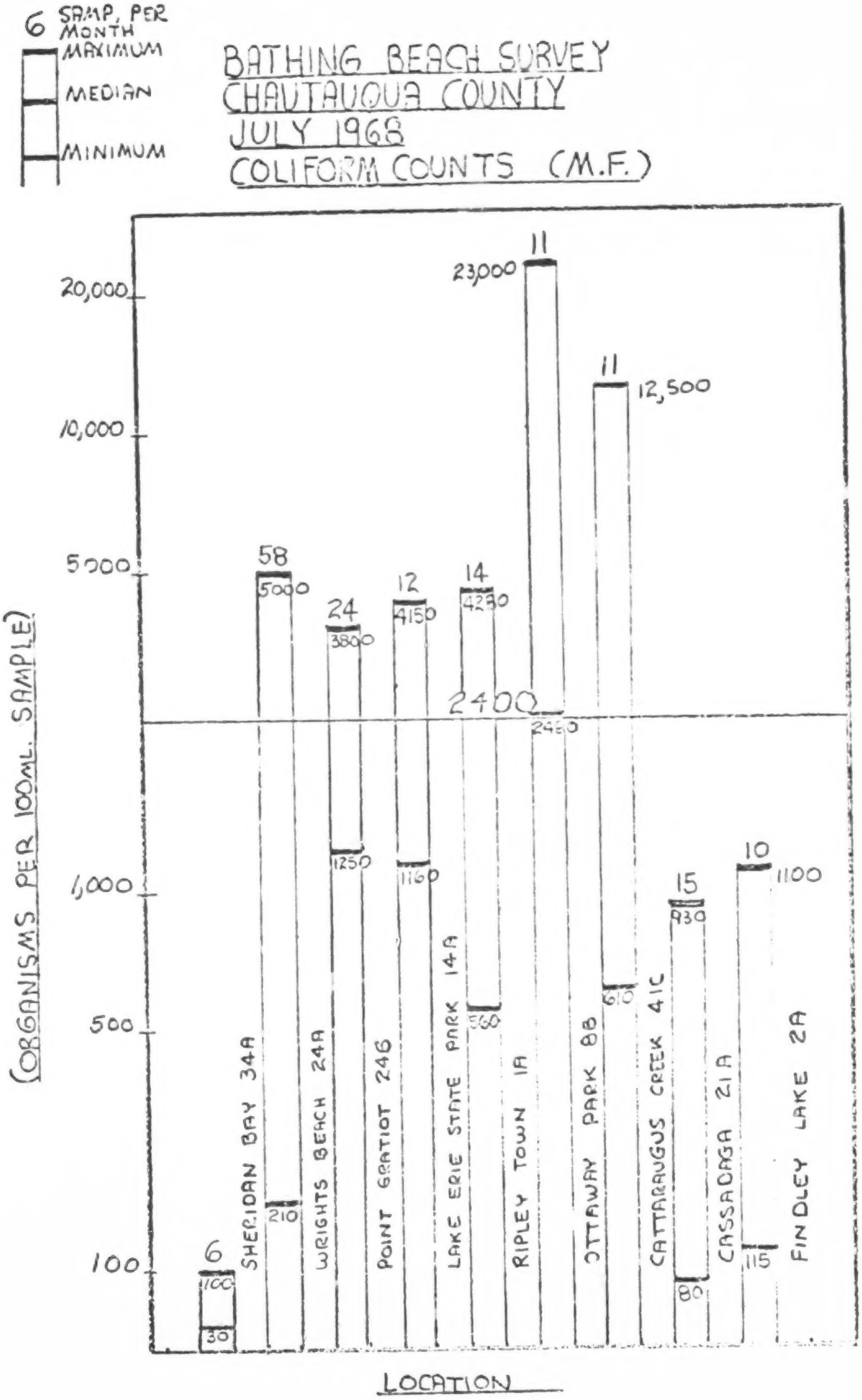
PLACE	JUNE					JULY					AUGUST					ENTIRE SEASON				
	NO. OF SAMPLES	NO. OF SAMPLES WITH FECAL COLI.	NO. OF SAMPLES > 5000	% OF SAMPLES > 5000	MEDIAN COLIFORM	NO. OF SAMPLES	NO. OF SAMPLES WITH FECAL COLI.	NO. OF SAMPLES > 5000	% OF SAMPLES > 5000	MEDIAN COLIFORM	NO. OF SAMPLES	NO. OF SAMPLES WITH FECAL COLI.	NO OF SAMPLES > 5000	% OF SAMPLES > 5000	MEDIAN COLIFORM	NO. OF SAMPLES	NO. OF SAMPLES WITH FECAL COLI.	NO. OF SAMPLES > 5000	% OF SAMPLE > 5000	MEDIAN COLIFORM
CATTARAGUS CK. 41C	NO		SAMPLES			11		2	18%	610	12		0	0	1255	23		2	9%	1230
CASSADAGA LAKE 22A	NO		SAMPLES			15		0	0	80	5		0	0	290	20		0	0	150
TOTALS	42		0	0	590	358		10	3%	160	413		4	1%	590	813		14	1%	200

BATHING BEACH SURVEY
CHAUTAUQUA COUNTY
JUNE 1968
COLIFORM COUNTS (M.F.)



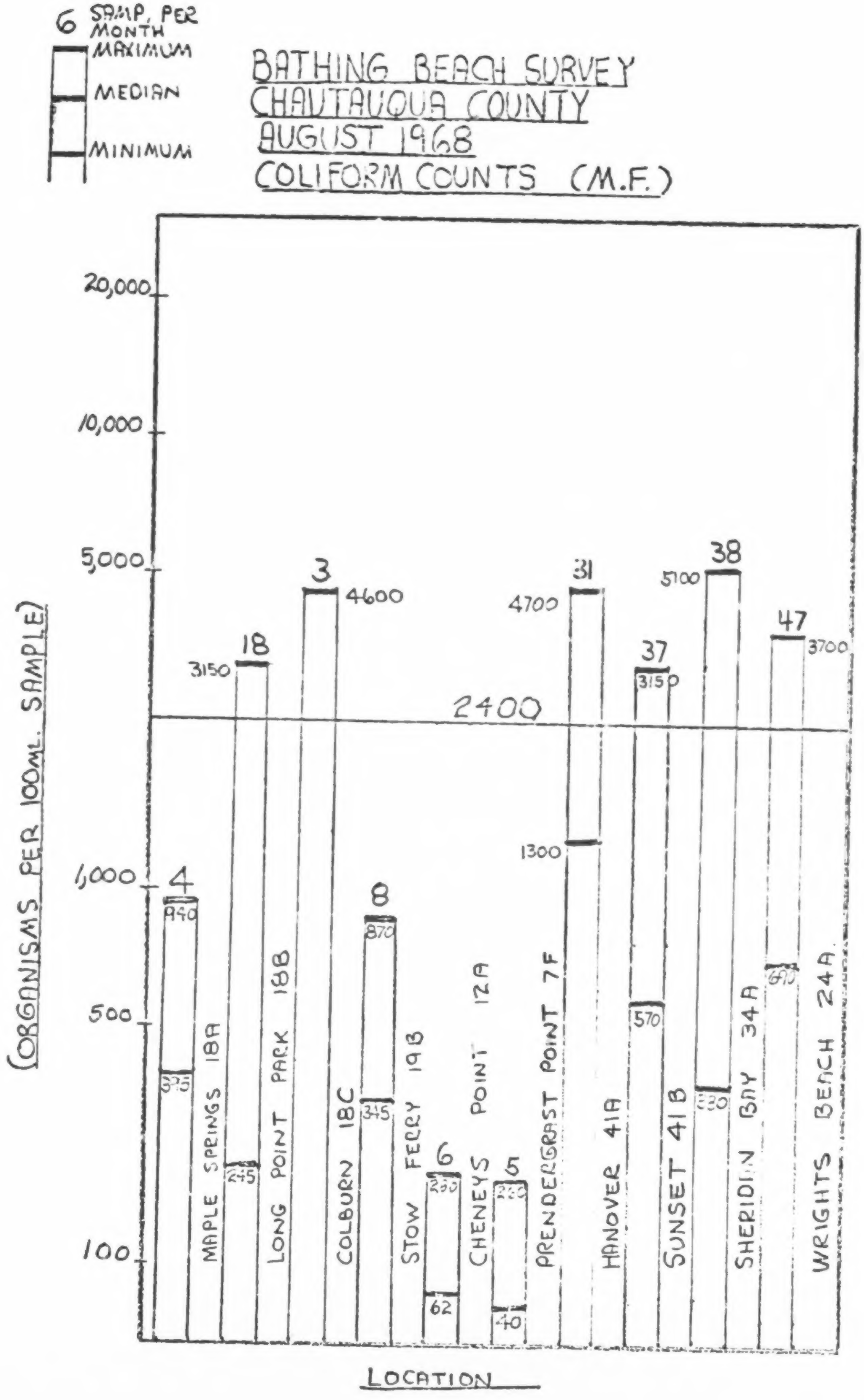


BATHING BEACH SURVEY
CHAUTAUQUA COUNTY
JULY 1968
COLIFORM COUNTS (M.F.)

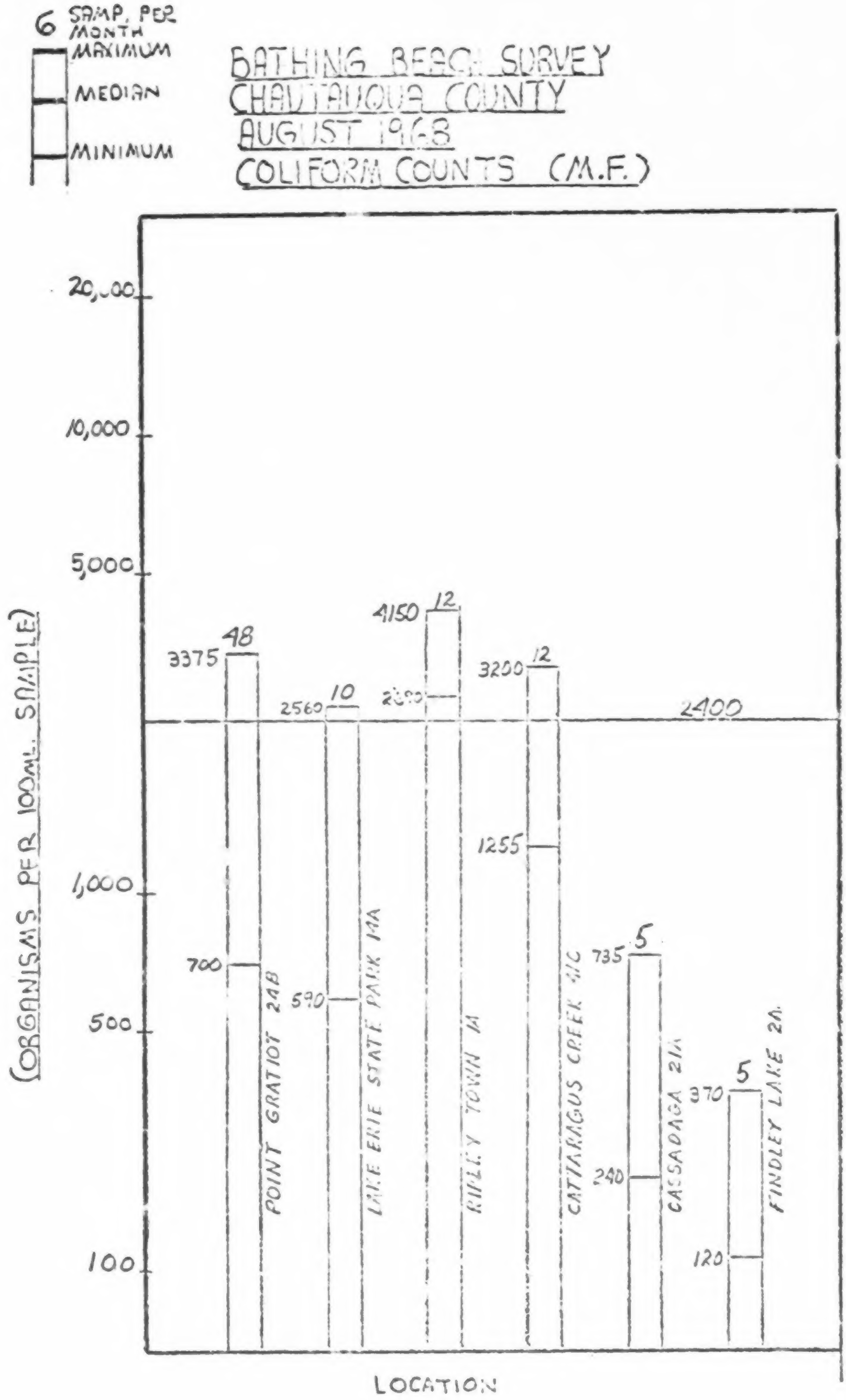


BATHING BEACH SURVEY
CHAUTAUQUA COUNTY
JULY 1968
COLIFORM COUNTS (M.F.)

BATHING BEACH SURVEY CHAUTAUQUA COUNTY AUGUST 1968 COLIFORM COUNTS (M.F.)



BATHING BEACH SURVEY
CHAUTAUQUA COUNTY
AUGUST 1968
COLIFORM COUNTS (M.F.)



MR. STEIN: Thank you.

Are there any comments or questions? If not, thank you very much for the presentation.

I think we have raised some real points, and we will, in the discussion, try to resolve the phosphate question. As a matter of fact, the way the statements are coming in, I think we are remarkably close together at this point, and unless something develops, I don't now anticipate too much difficulty, but I would suggest that the Conferees keep that in mind as we proceed.

We will now call on Ohio, Mr. Eagle, and, Mr. Eagle, we would ask you to manage your own time, but if we run into the lunch period, if you can find a convenient time to split or break, we would appreciate your letting us know when that could be.

MR. EAGLE: All right, sir.

MR. STEIN: Thank you.

STATEMENT OF GEORGE H. EAGLE, CHIEF ENGINEER, OHIO DEPARTMENT OF HEALTH, COLUMBUS, OHIO

MR. EAGLE: Mr. Chairman, Conferees, ladies and gentlemen. My name is George H. Eagle. I am the Chief Engineer of the Ohio Department of Health. The Division of

Engineering serves as the technical staff of the Ohio Water Pollution Control Board. On behalf of the Board and the Department, I wish to submit this report in its entirety for the record.

MR. STEIN: Without objection, it will be done.

MR. EAGLE: This report is a progress evaluation of the Ohio program for compliance with the conclusions and recommendations of the Lake Erie Pollution Enforcement Conference of August 1965, as directed in a letter under date of June 6, 1969, from the Secretary of Interior.

WATER QUALITY STANDARDS

Since the June 4, 1968, meeting of this conference, the Ohio Water Pollution Control Board adopted stream water quality standards for the Rocky, Cuyahoga, Chagrin, and Grand River intrastate tributaries of Lake Erie.

The standards, as well as the schedule of corrective measures for their implementation, are presented in Appendix I. The implementation schedules are generally in accordance with those adopted by the Conferees; however, some schedules have been changed so as to be consistent with more recent developments. In a few cases, the treatment requirements necessary to meet local water quality standards are more stringent than the recommendations of the Conferees.

G. H. Eagle

SECONDARY SEWAGE TREATMENT

Following is the status of secondary sewage treatment facilities in the Ohio portion of the Lake Erie Basin: (See Appendix II - Table 1, for listing).

		6/69	5/68
(1)	Total number of facilities in Lake Erie Basin	132	
(2)	Number of adequate secondary sewage treatment facilities	59	
(3)	Number of secondary sewage treatment facilities constructed or improved since August 1965	36	
(4)	Number of inadequate secondary sewage treatment facilities	73	85
(a)	Under construction - completion in 1969	12	66*
(b)	Construction to be completed in 1970	14	15
(c)	Construction to be completed in 1971	34	3
(d)	Construction to be completed in 1972	10	1
(e)	Construction to be completed in 1973	3	-

* Includes ten scheduled for completion in 1968.

Since May 1968, five secondary sewage treatment plants were completed for communities that previously did not have treatment facilities; one sewer system was connected to another community's system; two primary plants were provided with secondary treatment; and, one secondary treatment plant was enlarged.

Facilities under construction include secondary treatment for: five communities not having any facilities;

five communities connecting to other communities having facilities; eight enlargements of existing secondary treatment facilities; and, one new secondary treatment plant to replace two small plants.

Detailed construction plans have been completed for twelve new or enlarged secondary treatment plants and for connection of one community system to another system. Several of these should be under construction in 1969.

You will note that many schedules have been extended from 1969 and 1970 to 1971 and 1972. Each of these extensions was given careful consideration by the Ohio Department of Health staff and the Water Pollution Control Board, and the only extensions granted were considered necessary for legitimate reasons. Problems in completing financing and engineering arrangements and services were the common reasons. Several are under orders of the Board and must report progress at continued show cause hearings before the Board.

INDUSTRIAL WASTES

Following is a summary of the status of the required industrial wastes treatment or reduction facilities. (See Appendix II, Table 2 for listing).

G. H. Eagle

	6/69	5/68
(1) Total number of facilities required as of May 1968	88	90
(2) Total number of adequate facilities completed since August 1965	25*	28
(3) Number of inadequate facilities	63*	62
(a) Under construction - completion in 1969	31	62**
(b) Construction to be completed in 1970	25	
(c) Construction to be completed in 1971	7	

* Additional requirements adopted by the Ohio Water Pollution Control Board for several industries.

** Includes 30 scheduled for completion in 1968.

The reason for extending the schedules for completion of 32 of the facilities from 1969 to 1970 and 1971 are many. Plant changes, engineering services, equipment availability, new requirements and Water Pollution Control Board hearings are some of them. Here again, as with the municipal dischargers, each extension was given careful consideration by the staff and the Board and only granted where considered necessary. There should be very few delays in the future in completing this program.

PHOSPHORUS REMOVAL

Following the October 4, 1968, session of the Conference, it was reported that the Conferees agreed that:

G. H. Eagle

"The policy of maximum phosphate removal from municipal and industrial waste sources to protect Lake Erie's water quality is reaffirmed. At the present time, it is believed that the States can best move this phosphate program forward by providing a minimum of 80 percent reduction of total phosphate loadings from the respective States.

"Each State water pollution control agency and the Department of the Interior shall list its municipalities, industries, and the Federal installations which discharge nutrients into the Lake Erie Basin and indicate which discharges have a deleterious effect on water quality. The list and detailed plans for treating these wastes shall be submitted to the Conferees within six months. The decision as to how much phosphorus is to be removed at small sources is the responsibility of each State agency as long as the total loading reduction is met."

In accordance with this agreement, I wish to report the following resume. Detailed listings of the wastewater treatment plants where phosphate removal facilities will be required are included in Appendix II - Table 3.

Now, just in summary, the total 1968 estimated population in the Ohio portion of the Lake Erie Basin is 3,400,000.

G. H. Eagle

The total 1968 estimated phosphate load (total P) from the Ohio portion of the Lake Erie Basin on the basis of 0.01 lbs./day/capita is 34,000 lbs./day.

Discharges Direct to Lake Erie. The total 1968 estimated phosphate load (total P) from the population served with public sewers along the Ohio shoreline of Lake Erie is 20,000 lbs./day (0.01 lbs./day/capita).

The expected phosphate removal at 14 plants along the Ohio shoreline of Lake Erie serving a population of 1,795,000 at this time we estimate to be not less than 90 percent, or a total of 16,155 lbs./day. All except two of these fourteen plants will be of the activated sludge and chemical treatment type. The Rocky River plant will be of the carbon filter type and the Cleveland Westerly primary treatment plant is proposed at this time to be converted to chemical treatment. It is our understanding that a full-scale study of chemical treatment will be undertaken in the near future at Cleveland Westerly. A representative of Cleveland will report on this in more detail a little later.

The schedules for completion of the phosphate removal facilities at twelve of these fourteen plants range from 1970 to 1972. At the two Cleveland plants schedules of completion in late 1973 are tentatively proposed. These advanced schedules are now being considered by the Ohio Water Pollution Control Board, in speaking of the ones at Cleveland.

Discharges to Tributary Streams. The total 1968 estimated phosphate load (total P) from the population served with public sewers discharging to the Ohio tributaries of Lake Erie is 14,000 lbs./day. (0.01 lbs./day/capita).

The expected phosphate removal at nineteen plants in the basin serving 1,272,575 people is not less than 90 percent, or a total of 11,450 lbs./day. All except four of the nineteen plants will be of the activated sludge and chemical treatment type. Three -- Bedford, Bowling Green, and Norwalk -- will be of the trickling filter-chemical treatment type; and one, Painesville-Fairport, will use carbon filters.

The schedules for completion of the phosphate removal facilities at these nineteen plants discharging to the Ohio tributaries of Lake Erie range from 1970 to 1975. Studies are now underway at many of the existing secondary sewage treatment plants, and it is quite possible that phosphate removal facilities can be designed and installed at several of the plants before 1975.

Summary

Total phosphate load to Lake Erie from Ohio municipalities (1968)	34,000 lbs./day
Total expected removal from shoreline population by 1973	16,155 lbs./day
Total expected removal from tributary streams by 1975	11,450 lbs./day
Total removal	27,705 lbs./day

Expected removal 27,705/34,000 equals 81.4 percent of total

Miscellandeous

The Ohio programs requiring disinfection of sewage effluents, reduction of bypassing and combined sewer discharges, sampling and reporting of industrial waste discharges and stream water quality surveillance, which were reported upon in some detail at the Fourth Session of this Conference, are progressing.

All of the principal sewage treatment plant effluents discharged to Lake Erie are continuously chlorinated during the bathing season. Chlorination is also practiced at many of the plants discharging to the tributary streams and several more are installing disinfection facilities in connection with plant improvements and enlargements. It is Ohio's policy to require disinfection facilities at all new or enlarged sewage treatment plants of significant size in the Lake Erie Basin.

G. H. Eagle

Increased emphasis is being given to the bypassing and combined sewer discharge problems. We are insisting that effective programs for the prohibition of the connection of foundation drains to sanitary sewers in new construction be carried out by every municipality, county and other responsible agency. This has caused quite a furor in some areas, particularly among the home builders.

The plans and programs for the three major trunk sewers in Cleveland which will take the sewage from the outlying areas out of the combined sewers and convey it direct to the treatment plants are moving along fairly well. Much of this work should be under construction next year. The estimated cost, as of about three years ago, for these three trunk sewers was $66 million.

It has been reported that the city of Cleveland is developing a comprehensive plan and program for necessary rebuilding of the Big Creek interceptor. This sewer broke again recently and is discharging about 25 M.G.D. of untreated sewage to the Cuyahoga River. I presume the Cleveland representative will cover this matter in his report.

The stream and lake surveillance programs are being implemented. Additional automatic water quality monitoring stations are recommended for inclusion in the

Northeast Ohio Water Development Plan which is scheduled to be completed in fiscal 1970 and implemented as rapidly as possible thereafter.

Now, I would like to call on Dr. Edward Martin, who is chairman of the task force group here in Cleveland on water pollution control, to make some comments with regard to the Cleveland program. Dr. Martin.

STATEMENT OF DR. EDWARD MARTIN, DIRECTOR,
CLEAN WATER TASK FORCE, CLEVELAND, OHIO

DR. MARTIN: Mr. Chairman, Conferees, ladies and gentlemen.

First of all, on behalf of the Mayor of the city of Cleveland, Carl Stokes, I would like to welcome you here to Cleveland for this progress meeting of the Lake Erie Enforcement Conference. The Mayor, although wanting to be here, could not make it this morning.

Last summer, in June of 1968, when this meeting was held, the Mayor promised a rather unprecedented step for the city of Cleveland, namely that a $100 million bond issue would be placed on the ballot.

As most of you know, we have been successful in this regard. The bond issue was approved last November by the voters, and we now have, I think, a significant amount of money with which to begin our program.

In February of this year, the Administration took a second rather unprecedented step with the creation of the Clean Water Task Force to put together the necessary technical expertise to come up with what I believe to be one of the Nation's number one programs in water pollution control.

The objectives that were developed by this Conference in 1965, we feel, are as applicable and as necessary then as they are now. These objectives, I think, all of you will agree, are to secure and maintain an adequate quantity and quality of water necessary for the promotion and protection of our public health and safety in this community: public water supply, industrial water supplies, and recreation.

The city of Cleveland has, in the past, and continues now with a very active program to meet these objectives.

New construction has been under way for several months at both the Easterly and Southerly wastewater treatment plants, and this construction will increase the secondary treatment capacity of these plants by five to thirty percent. We believe that this will lead to improvements in the quality of the final treated wastewater as well as decrease the amounts of wastes which must be bypassed during peak load periods.

The construction at both of these facilities should be completed sometime early next year. Since 1968, we have spent a total of about $16.5 million in additional plant construction at these facilities.

There are three completely new thrusts to the Cleveland efforts which I would like to discuss very briefly here this morning.

In 1966, the city created a Bureau of Industrial Wastes for the first time as a part of its water pollution control effort. Within the past few weeks, the City Council has approved a quarter of a million dollar program for the preliminary design of an industrial waste program for this city. I would like to point out that this is a unique step on the part of the city, probably the first time in our history that we have specifically allocated funds at the municipal level for the treatment and control of industrial wastes. This program is getting under way now.

The objectives are to develop both joint treatment facilities for industrial wastes, which the Westerly plant will be one -- and I will talk about that later -- and also individual treatment facilities for those industrial wastes which lend themselves to collection and disposal at a central facility such as oil wastes and plating wastes, and some others.

The second major thrust is with regard to nutrient removal from the municipal wastes themselves, particularly the removal of phosphorus. The Enforcement Conference has made recommendations with regard to improved phosphorus removal, and the city of Cleveland plans to meet these recommendations in its treatment plants, all three of our facilities.

For the whole period of this summer, 1969, we will be by chemical treatment means removing about 80 percent of the phosphorus from the Westerly sewage treatment plant, which, as you know, is a primary facility. We are doing this to remove nutrients from the entire flow of the Westerly plant for the period of the summer. This is expected to get under way within the next two weeks.

Along with this, we expect to achieve high degrees of removals of other contaminants as well, and I would point out that we are doing this now in order to kind of close the gap between being able to construct a full-scale plant at Westerly. At the same time, congruent with this, we are proceeding with a new preliminary design for this plant. The new design will incorporate chemical physical separation techniques, and we will probably not use the conventional means of activated sludge treatment.

The first phase construction of this plant will begin later this year, and it will proceed in various phases until we finally have the entire plant constructed in 1963, probably by the fall of 1973.

We are investigating phosphorus removal particularly at the other two waste treatment facilities which we operate, both Easterly and Southerly.

The third major thrust of the water pollution control program here in the city is associated with the regional handling and management of wastes which you have heard something about this morning from other presentations.

The city of Cleveland, as you know, operates a system which goes far beyond our boundaries. We are attempting, in active negotiations, at this time, to incorporate 18 new suburbs into the Cleveland system, the wastes from which will ultimately end up at the Southerly plant, and receive both good secondary treatment, and in accordance with the schedules which we will submit here this morning, phosphorus removal as well.

This project has been discussed in some detail with the suburbs involved, and the Ohio Water Development Authority has in a preliminary way at least favorably received this for funding.

Presently the communities involved either do not have any waste treatment facilities operating a small waste treatment plant, or are about to construct, or had preliminary plans for construction of new waste treatment facilities.

We believe, as has been discussed here this morning, that this is probably the most significant step that we can take in a water pollution control program, namely, to make it an area-wide or regional program and do a good job with treating effluents.

We believe that this program will result in lower costs both to the residents of the city of Cleveland and to the suburbs involved, and at the same time result in very much more effective pollution control.

During the summer of 1968, we concluded the Waite City beach project. This area was cordoned off from the rest of the lake and chlorinated so that we could use it for swimming. This summer we have almost completed the construction of the new swimming facility at Edgewater Beach, and if the gentlemen would like to come back in a week or two, we will invite them to take a swim with us at the Edgewater Beach project.

MR. STEIN: Are you going to provide coliform counts first?

DR. MARTIN: Yes, sir.

As we stand right now, we believe that we have made a very significant commitment in terms of funds and the technical resources to make the most significant attack on water pollution control anywhere in the Great Lakes area.

I would like to say that, however, we cannot do this job alone, and the primary lack at this particular point in time as far as the city of Cleveland is concerned are funds to match the funds which are available both from the city of Cleveland and from the State of Ohio to completely accomplish the objectives and goals that we have in mind.

We have submitted written schedules on treatment plant construction to the Conferees and to the Ohio Water Pollution Control Board, through Mr. Eagle, this morning.

The schedules for the construction of plants, as you will note, relate to all three of the wastewater treatment plants.

I would like to point out that if there are any detailed questions which you may have with regard to the program we would be happy to answer them. There is a diagram over here with regard to the Westerly plant which we invite all of you to look at. This is the first step of the preliminary design of this plant. There are a number of various significant technical results from proceeding in this way.

Number one: There is a very much reduced land requirement for the kind of a plant which we have proposed here; and, number two, there is a very much reduced capital expenditure required for the construction of this kind of a plant, although the plant will require increased total operating and maintenance costs.

Thank you, gentlemen.

MR. STEIN: Thank you. Would you just wait, Dr. Martin? I think there may be some questions.

MR. EAGLE: Could we defer until one more speaker, then we will have questions?

MR. STEIN: Delighted.

MR. EAGLE: Okay. Don't go away, please.

DR. MARTIN: Okay.

MR. EAGLE: I have one more person I would like to have participate in this progress report and, as you heard here this morning, one of the major problems, if not the major problem in this whole program, is financing, and certainly Ohio is not any different from any other States in this respect, so I would like to have Mr. Ned Williams, who is the Executive Director of the Ohio Water Development Authority, explain his program which is now getting under way in this State. Mr. Ned Williams.

STATEMENT OF NED WILLIAMS, EXECUTIVE
DIRECTOR, OHIO WATER DEVELOPMENT
AUTHORITY, COLUMBUS, OHIO

MR. WILLIAMS: Mr. Chairman, Conferees, ladies and gentlemen. The Ohio Water Development Authority was created about a year and a half ago by the 107th General Assembly. In May of 1968, we had a seven-member authority appointed which we were fortunate to have Mr. Sharon Bresler, Utility Director of Lima, as the Chairman of the Authority. Two members of the Board are ex officio, Dr. Emmett Arnold of the Ohio Department of Health, and Director Morr of the Department of Natural Resources.

OWDA was set up primarily as a financing, construction, and if need be an operating agency. The 6121 statutes, .01 to .27, cover our legal aspects and give us broad powers in financing, constructing, almost anything in the way of water or sewerage systems.

We have the power to issue notes, sell bond issues for projects, the two major aspects which we feel can be of great help in the pollution problem on Lake Erie and also throughout the State of Ohio, and this is with industry and also with what we call our five-year program.

With industry -- and, as you know, a great many of them are on permits from the Water Pollution Control Board -- OWDA can finance one hundred percent and construct wastewater facilities for the treatment of their wastes.

FROM THE FLOOR: Can't hear you.

MR. WILLIAMS: Is this better? Can you hear me in the rear?

I would like to divert just a couple of seconds and tell one story that did happen to me. I was using a PA system. As you know, PA systems vary from system to system and from room to room, and quite often when you are speaking, it is quite difficult to tell if the people in the back can hear you or not.

At one time I thought that you could stand just to one side of the microphone and hear it bounce off the back of the room, and if you heard something, the people could hear your words.

So I was speaking one day and I asked a gentleman in the back of the room if he could hear me. I explained that I was standing to one side of the mike and I could not hear my words coming back. And there was an old gentleman down in the front row spoke up and said, "Don't worry about it, son, you haven't missed a thing so far." (Laughter)

For those of you who have missed some of the words up to now, I will try to get more to the meat of the subject.

With industry, we can finance and construct and even operate the waste treatment facilities needed for industry.

There are several advances to industries for cooperating with OWDA. Number one, they do not have to tie up their funding capabilities in the cost of the structure which, in some of the plants -- for instance, in the Cleveland area -- could run eight, ten and twelve million. OWDA can sell the bond issue to finance these, and we would enter into an agreement with them for the payback of one hundred percent of the construction cost of the facility. Industry, then, would make annual payments to retire the principal and the interest on the cost of the facility to OSDA, and this, of course, is similar to leasing equipment as a direct writeoff, as well as not having their funds tied up, as I mentioned before.

The other program that I mentioned was a five-year program, and the five-year program came about, as has been mentioned a number of times by several States this morning, that unfortunately funding for the Public Law 660 program, the 30 percent grant-in-aid through FWPCA for the sewage treatment facilities, has been below the expectations, I am sure, of both the State and also, of course, the people in FWPCA.

Last year, Ohio received some $9.4 million on a 30 percent grant-in-aid program for the sewage treatment facilities. In March of this year, we compiled a list of some 229 communities, on orders of the Ohio Pollution Control Board, with an estimated construction cost of $459 million.

Now, obviously, the $9.4 million was an aid, but $9.4 million was not reaching the $450 million figure that we are in deficit of as of March of this year.

So we have put together a program which we are proposing to reach this $450 million figure. It works briefly like this: There is a House Bill 882 in the Legislature at the present time, and the House Finance Committee, being heard, appropriating $100 million from the last State bond issue to the Ohio Water Development Authority.

Now, we are proposing to take the $100 million and start on this list of 229 potential customers who need sewage treatment facility improvement and start constructing, financing one hundred percent the cost of the construction of these facilities with this $100 million.

At the same time, we will enter into an agreement with the communities involved for the repayment of 70 percent of the project costs. The project costs will be construction costs plus the interest rate on the 70 percent of the project cost. This money is to be repaid in yearly increments, and these projects can be financed up to a period of 40 years. It is optional with the municipalities involved if they would like a shorter financing period.

We are proposing, after the $100 million is exhausted on these projects, to use the income from the 70 percent repayment on the $100 million to secure additional bond financing. This bond financing will then be rolled back into additional construction, and, of course, there will be 70 percent of this repaid.

With $100 million to be appropriated of the State funds, hopefully $10 million per year for the next five years, which would be $50 million of the FWPCA Federal funds, selling $300 million bond issues secured by this 70 percent repayment, we can get to approximately $500 million in construction on sewage treatment facilities for the municipalities in the State of Ohio.

This is our program. Once again, I think the two areas, although we can finance almost anything in the way of wastewater treatment facilities, the two big programs are, or two areas that we feel we can do the best job is with industry on industrial needs, and with extending the 30 percent grant-in-aid program to all municipalities within the State of Ohio.

We are planning to distribute FWPCA funds throughout all of the projects, so that if hopefully in the future there is some reimbursement or additional Federal funds to come back to the State of Ohio, that these projects will be eligible for reimbursement.

Thank you, Mr. Chairman.

MR. STEIN: Thank you, Mr. Williams.

Now, let's have questions, either to -- is that all right?

MR. EAGLE: Yes, Mr. Chairman and Conferees, this concludes our presentation, so far as progress of facilities is concerned.

MR. STEIN: Right.

MR. EAGLE: And, if you have any questions, we will be glad to try to answer them, either to me or to the other two gentlemen.

MR. METZLER: I have several questions I would like to ask Dr. Martin, but since Mr. Williams is up here, I have a question I would like to ask him perhaps before he gets away from the microphone, George. I don't, at the moment, have any questions about your presentation.

MR. EAGLE: Okay.

Mr. Williams.

MR. METZLER: I am very much interested in your approach -- and this is novel so far as I know, other than our own State which also has some somewhat similar legislation.

My question: Have you attempted to sell this approach to any groups of industries, and have you had any good experience with their buying it?

MR. WILLIAMS: Yes, sir, we have fortunately. We are an infant organization, as I mentioned before, in that we did staff in March of this year.

We are now, I am very glad to say, cutting the stencils on our first industrial project. I think the first one is a major hurdle or a milestone for us in that industry, I am sure, has been watching OWDA to see what impact we will have, whether we are actually a working organization, or just one more State agency.

I think also there has been a little reluctance on the part of industry to look at State agencies, and, of course, Federal also -- a little askance as to more controls and just what impact we would have.

Our first one, as I say, we are now cutting stencils. We hope to advertise about the first of August. We are in contact with a number of other industries and we feel after we get a few of these going, and we demonstrate we can do a job, we have constructed something, that others will fall in line, and we sincerely believe and know that we do have something to offer industry as an aid in getting waste treatment facilities constructed.

MR. METZLER: I want to point this up because I think you have made a great deal of progress considering the youth, how recently you have gotten started here. But you have made proposals to industry, and industry has accepted. You have an example or two of this, is that right?

MR. WILLIAMS: Yes, sir.

This first one, the one that we are preparing to advertise now, is well down the road of the final plans and specs are being prepared; our agreement with them for the financing and the repayment is under way. We hope within a couple weeks to wrap this one up, and we hope to follow this with many more.

MR. STEIN: Any other comments?

Is this in Lake Erie Basin, by the way?

MR. WILLIAMS: Unfortunately the first one isn't, but we are in contact with several that are.

MR. POOLE: You sell water development bonds for these industrial projects?

MR. WILLIAMS: Yes, sir. If, for instance, there was a million-dollar project, we would have the bond issue sell a million dollars for the project. We would then go ahead and construct it under the law. We would advertise for the construction, construct it, enter into an agreement with them for the payback of, in this case, one hundred percent of the project cost, which would be, of course, the principal, the going or the interest rate on the money, the engineering fees, and the other incidentals. It does relieve them the necessity of going to the market and tying up their capacity to finance.

MR. POOLE: That is separate and apart from this hundred million, then, that you described for the municipalities?

MR. WILLIAMS: Yes, sir, this is right.

MR. POOLE: Over and above that, we have the statutes and the power now to proceed with this program. Our hundred million will be hopefully appropriated within the next month so we can go with this, but they are two of course, Federal also -- a little askance as to more controls and just what impact we would have.

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distinct programs.

MR. STEIN: Are there any other comments or questions?

Mr. Purdy.

MR. PURDY: Initially on the hundred million program, will this again be one hundred percent financing?

MR. WILLIAMS: This is right. We are proposing to finance one hundred percent of the project cost. The political entity will pay back 70 percent, and this, of course, is a 30 percent grant-in-aid program that we are extending.

Also, here again, OWDA would be financing the project rather than the municipalities.

Now, we propose to do this in the manner that the largest cities will not be penalized; the smaller cities will probably accrue a little more benefit on interest charges on this program. In all events, all municipalities get the benefit of a 30 percent grant-in-aid.

MR. PURDY: You described a scheme where the repayment moneys now would be used to finance additional bonds, and you anticipated blowing that program into a $500 million program.

MR. WILLIAMS: Yes, sir, roughly mathematically we take $100 million State funds, $50 million Federal funds, the $10 million for over five years, and equate this to the hundred percent, as opposed to 30, of course, we come up with $500 million. Obviously the $150 million eventually is used up in the 30 percent grant, but it enables us to sell $300 million more, and this is the 70 percent paid back.

MR. POOLE: Well, the 30 percent grant, then, is actually a combination State and Federal grant, is that correct?

MR. WILLIAMS: That is right. We would have one hundred State, hopefully $50 million or -- and, here again, we have a program. If we had no Federal funds, obviously it would cut back dollar amount. If the Federal aid increases, we would go beyond the $500 because it would go into the pool also for construction.

MR. PURDY: What is the $50 million based on -- $50 million of Federal funds -- how is this arrived at?

MR. WILLIAMS: This is just an extension of the fact that we have got approximately $10 million last year; we anticipate $10 million this year. Hopefully, over the five years, we would get at least $10 million Federal funds.

MR. STEIN: Are there any other comments or questions?

Thank you very much for that statement, Mr. Williams.

I think the kind of thing we have heard about from Mr. Williams in Ohio is one of the more interesting developments in this field. It goes even beyond water pollution control because it may be an answer for the question of what kind of services, real services can State Government perform in our society today, and this deals with the entire Federal, State, and municipal relationship.

I know similar programs have been developed with variants in New York, that Maryland is considering a variant of this program, and several other of the States are doing this; and this may well provide one of the most effective ways we have of State Governments giving this coordination and the impetus to move forward to getting treatment works built and preserving the quality in the water.

Are there any other questions or comments?

Let's go on with Dr. Martin.

Mr. Metzler.

MR. METZLER: Doctor, I have a few questions I would like to ask.

The first one deals with the design of this physical chemical treatment plant, and I am interested in -- is this based on some pilot plant work that either you or others have done, or is this based on full-scale treatment, or based on theory?

DR. MARTIN: This is based on pilot plant work -- two things: pilot plant work that has been done at both Lake Tahoe, and in Washington, D.C., and our own pilot plant work which we will do here.

MR. METZLER: And I assume that the results of that are available to Conferees.

DR. MARTIN: Of which, sir?

MR. METZLER: Of yours.

DR. MARTIN: We are beginning to do the pilot plant work right now. This was the second part of the Westerly plant program which I mentioned in my presentation.

MR. METZLER: Do you anticipate any help from this forward-looking legislation of Ohio, the Ohio Water Development Authority?

DR. MARTIN: Yes, sir. As a matter of fact, two of the major thrusts which I mentioned are designed deliberately to coincide with the Ohio program. The first of these is the industrial waste program which I mentioned. After we have a good idea of what our industrial waste problem is, which we do not have at this time, we plan to work together with the industries in our area to assist them in both our point of view and from the point of view of the Ohio Water Development Authority to make use of the State plants.

The second part is the regional attempt which I mentioned. I believe, and I think it is a general engineering conclusion, that one can do things cheaper by putting various effluents together rather than by building a series of small waste treatment plants, so that we can get funding from the Ohio Water Development Authority much more readily by having regional or area-wide designed programs rather than by proceeding with this on an individual basis.

So both of these parts of the Cleveland program are specifically designed to coincide with the State's program.

MR. METZLER: Do I understand, from your comments, that you still really don't know the size of the industrial waste problem, though having toured the river -- it must have been three years ago, it was in June of 1966, a little boat trip of the river with Congressmen and other top officials. This was pointed out, and you still don't know the size of it?

DR. MARTIN: Yes. Let me clarify that. I made the comment, for example, that we have established a Bureau of Industrial Wastes. Up to this time, this has been a very minor effort, and we have, over the course of the past three years, been able to take a look at a number of specific industrial waste problems, but not, of course, at the whole range of problems which we have here, and are rather significant, I think, in our industrialized area. So we will proceed in more detail to get this over the coming six to ten months.

MR. METZLER: The schedule that you submitted -- is financing at hand o r available for this, or does this depend upon some unknowns yet in the equation?

DR. MARTIN: On our scheduling plan for what we have -- in other words, additions to Easterly, additions to Southerly, and construction of the Westerly plant -- depend on State funds. It depends on working with the Ohio Water Development Authority and through the OWDA to get some of the rather small -- a rather small fraction, but some of the Federal funds which will be forthcoming through that program.

Additional funds, in our case, from the Federal Government, will help us accelerate the program which we have, achieve complete nutrient removal a lot quicker, and also permit us to get much more serious about the industrial waste effort.

MR. METZLER: One other question. You mentioned the open lake chlorination. I would be interested in a one- or two-sentence evaluation of whether this was effective, and if so in making some of the data available to some of the rest of us that have similar problems.

DR. MARTIN: Yes, sir. We have a very short report which was prepared by our people on the Waite City program last summer. This is available. We calculated that there were approximately 10,000 people used this facility during the course of last summer. We expect more people to use it this summer, and the Edgewater facility as well. There are some data available, and we can make these available.

MR. METZLER: One other point. If I am allowed a personal privilege, Mr. Chairman, I would like to compliment Mayor Stokes and the city of Cleveland for having gone out and recruited a top-notch professional to really see that this program is carried through. It is very heartening.

MR. STEIN: I would concur. I am not sure he had him recruited. Our loss is Cleveland's gain.

MR. POOLE: So is mine. He has just recruited one of my engineers as water commissioner.

MR. METZLER: Things are tough all over.

FROM THE FLOOR: When are you going to fix the Big Creek sewer?

MR. STEIN: Let's wait. I think that question will be coming up. Let's wait in order for the Conferees to handle this.

Mr. Purdy?

MR. PURDY: Yes. In Mr. Eagle's report, he made reference to the Big Creek interceptor, and that it is now discharging 25 million gallons per day of untreated sewage to the Cuyahoga River, and that he presumed he would cover this.

I am wondering when this break occurred, and has some immediate action been taken to correct it, or when is correction scheduled?

DR. MARTIN: Is Mr. Wolfs here?

The Commissioner of Engineering and Construction who deals with the design of our sewer program is not here at this moment. We are planning to submit -- along with our schedule for treatment, planning construction -- to the Ohio Water Pollution Control Board schedules for the construction of the sewers as well. This is being prepared literally at this moment, and we plan to have this available later in the day with regard to Big Creek.

MR. STEIN: Dr. Martin, could we have that when we reconvene after lunch?

DR. MARTIN: I would hope so.

MR. STEIN: Yes.

DR. MARTIN: With regard to the Big Creek interceptor, construction is under way now, at this moment. It began about a week ago, to repair the Big

Creek interceptor problem.

The reason for the delay, with regard to Big Creek, is associated with the fact that the design of that whole sewer system in the southwest area is proceeding along at the same time. We are working with this in conjunction with the State Highway program for the construction of new freeways, and we believe that we can arrive at a considerable savings in money by proceeding in this fashion.

We will repair the Big Creek interceptor. Again, as I mentioned, this is going on right at this moment, and we hope that we can.

MR. PURDY: When did the break occur?

FROM THE FLOOR: This was May the nineteenth.

DR. MARTIN: This was early in May, middle of May.

MR. STEIN: And when is it going to be completed?

DR. MARTIN: We expect this construction to be completed within the next month or two, I think. I am not sure on all these details. I would have to have Mr. Wolfs answer these questions.

MR. STEIN: I think for everyone's benefit it might be well to get the dates.

DR. MARTIN: Yes, sir, we plan to.

MR. STEIN: So everyone can make a judgement as to whether this is on schedule or not. Again, I can appreciate the position of moving ahead with the highway program, but my experience is when we always coordinate the sewer building program with the highway building program, we begin compounding delays in both the programs, and I hope this doesn't occur.

DR. MARTIN: We plan to have the schedule for the Conferees.

MR. PURDY: You mentioned that at the Cleveland Westerly plant, the primary treatment plant, that you have converted this over for this summer to chemical treatment for removal of the phosphates.

DR. MARTIN: Yes.

MR. PURDY: Will this continue now until you have built the new additional facilities?

DR. MARTIN: No. We plan to continue during the critical period of the summer months. At that time, we will reevaluate what we have been able to do in terms of chemical treatment and make another decision at that point about whether to continue on with this.

MR. PURDY: Are you saying that, in your opinion, the critical time for Lake Erie is only during the summer months?

DR. MARTIN: Well, it is for us in this particular case because the discharge is so near the

Edgewater project. The discharge relationships of phosphorus to Lake Erie and its effects, I think, are another question.

MR. PURDY: Now, in the report it mentions that the two Cleveland plants schedules of completion in late 1973 are tentatively proposed. This is for phosphate removal?

DR. MARTIN: Yes.

MR. PURDY: What is meant by "tentatively proposed"?

DR. MARTIN: Let me ask Mr. Eagle to answer that.

MR. EAGLE: It has been proposed to the Ohio Water Pollution Control Board, but they still have it under consideration and have not taken any action.

MR. PURDY: Proposed by who?

MR. EAGLE: The city of Cleveland, in connection with the renewal of their permit, and this is under consideration by the Water Pollution Control Board at this time.

MR. PURDY: In the report it mentions advanced waste treatment construction 1975 in the one case. What is meant here?

MR. EAGLE: Advanced or phosphate removal?

MR. PURDY: On page nine, Cleveland Southerly area --

MR. EAGLE: Oh, this is tertiary treatment.

MR. PURDY: That is tertiary. It does not refer to the phosphate removal?

MR. EAGLE: No, this is to go ahead before then. I believe this is correct.

DR. MARTIN: I am sorry, sir?

MR. EAGLE: Phosphate removal at Southerly is to go forward before advanced waste treatment?

DR. MARTIN: We will go forward at pretty much the same time. In other words, the contractor and the consulting engineer for the Easterly project was advised yesterday, for example, to include phosphorus removal in the design for expanded facilities at Easterly. They will go forward at the same time.

MR. PURDY: And you expect those to be in operation in 1973 at the present schedule?

DR. MARTIN: Yes, sir.

MR. PURDY: Now, on your Westerly plant, this chemical physical treatment -- could you be slightly more specific about the time of facilities that are proposed there?

DR. MARTIN: Yes. The Westerly Plant will consist of chemical treatment with lime or ferric chloride. This has not been determined yet. Or a combination of lime and ferric chloride, or a combination of lime and ferric chloride and polyclectrolites, followed by carbon treatment for the removal of the residual refractory organics, followed by phosphorus removal with activated alumina columns.

Now, we also have, in the preliminary design -- this will be piloted -- the removal of nitrogen by ion exchange. Since the nitrogen question is still somewhat open to discussion, this will either -- let's say at the point two years from now or 18 months from now, when this information is concluded -- will either be included in the full-scale design or not included, depending on more technical information which we hope to have at that time about the effects of nitrogen upon the lake. So that this is a project which is not just an attempt to meet the phosphorus removal requirements, but to go beyond this in terms of assessing -- if it is concluded that nitrogen removal is necessary, for example -- this nitrogen removal, we will be in a position to put this on stream at the Westerly plant.

MR. PURDY: That is all.

DR. MARTIN: And that is a brief summary of the Westerly thing. There are more details on the diagram over here, but I can go into it or you can look at it.

MR. LYON: Dr. Martin, on page three of the Ohio report, it indicates that the Easterly and the Westerly phosphate removal plants will go into operation in 1973. Is that correct?

DR. MARTIN: Mr. Lyon, this is the planned date now, yes.

MR. LYON: I see. In other words, you will not be meeting the same schedule as Detroit and the others.

DR. MARTIN: I don't know specifically what Detroit's is.

MR. LYON: It was my understanding that Detroit would go in by 1971 or 1972.

MR. PURDY: By late 1971 or mid-1972.

DR. MARTIN: If that is the case, then, we will not be meeting the same schedule.

MR. STEIN: What schedule will you be meeting specifically? When are you going to get the work done? There is a little confusion -- from 1973 or 1975?

DR. MARTIN: I think the confusion here is what was stated in the Ohio report. I think we can have Mr. Eagle clarify this.

MR. POOLE: You referred two or three times to him giving us a Cleveland schedule. I haven't seen any.

MR. EAGLE: He has a schedule but he hasn't distributed it.

DR. MARTIN: I have three copies.

MR. LYON: I am not sure when Cleveland will be doing phosphorus removal and why it would be done later than the other major municipalities.

DR. MARTIN: I don't know about the other major municipalities; I know with Cleveland's program, and that is our proposed schedule.

MR. STEIN: How about the answer to the first part of the question. When will you be doing phosphate removal in Cleveland?

DR. MARTIN: We will be doing phosphate removal, in accordance with the schedule Mr. Eagle has indicated, by 1973 at all of our treatment plants; that is Easterly, Southerly, and Westerly.

MR. LYON: There is one other question. In your discussion, you mentioned participation by the Ohio Water Development Authority.

DR. MARTIN: Yes, sir.

MR. LYON: And I am not sure whether there was some uncertainty about that or not. It is my general recollection that when Mayor Stokes came to our hearing sometime ago, he indicated that this program would move whether or not there would be Federal funds. I don't think he mentioned State funds at the time. Has the city changed its position?

DR. MARTIN: No, it has not.

MR. LYON: In other words, this program will go ahead whether or not there are Federal or State funds available?

DR. MARTIN: Yes, sir.

MR. LYON: In accordance with this schedule?

DR. MARTIN: Yes, sir.

MR. STEIN: Are there any further questions?

Mr. Poston.

MR. POSTON: I don't like to beat this matter of the Big Creek sewer to death, but I wonder: Are there any plans, investigations of that sewer to prevent breaks in the future?

It is my -- well, I don't remember it and know exactly how many years, but every year for quite a few in the past, the Big Creek sewer has broken and we have this 25 million gallons of sewage going eventually to the lake, and I wonder what is being done to give some assurance that this will not recur next spring.

DR. MARTIN: In the meantime, as I mentioned before -- Mr. Wolfs has just arrived, and we now have more detailed information with regard to our large interceptor sewers which are available. I would like to have Mr. Wolfs make additional comments, if I may, if it is acceptable to the Conferees, with regard to the Big Creek interceptor.

Mr. John Wolfs is the City Engineer, Commissioner of Engineering and Construction for the city of Cleveland.

STATEMENT OF JOHN R. WOLFS, CITY
ENGINEER, COMMISSIONER OF ENGINEERING
AND CONSTRUCTION, CLEVELAND, OHIO

MR. WOLFS: Mr. Chairman, Conferees, I am John R. Wolfs, City Engineer for the city of Cleveland.

In particular response to the question of the Big Creek sewer, this is one of three intercepting sewers that we have invested in excess of a million dollars for design services through three consulting engineering firms. I will only summarize this because it is a matter which I will turn over to the Secretary in full detail, specifically for the Heights sanitary trunk sewer, Broadway sanitary trunk sewer, and the Southwest suburban sanitary trunk sewer which in part will replace the Big Creek sewer. This work is under way at the present time in terms of design, detailed design, and we are in the process of receiving final printed copies of the preliminary plan for further implementation for determination of exact right-of-way, property ownership, and the design for construction purposes.

The Big Creek sewer has been a cause of considerable concern to the city of Cleveland. It is the only sewer that we have of this size that has been subject to failures such as we have experienced, principally because most of it is in an area subject to slides and in soil conditions that are subject to movement.

Part of the sewer -- the failure section -- has been where the transition has occurred where it goes underground to an aerial sewer traversing several valleys. This sewer is in an easement. The easement is such that we do not have good control over the land's usage.

In particular, at the present time, this sewer has a contractor working on it to correct the present deficiency for the purpose of putting it back in service.

Complicating the city's ability to plan intelligently and with a definite timetable, has been a so-called Jennings Freeway which is a non-interstate project and must in itself coordinate with interstate projects. Accordingly, we have been working with the Ohio Department of Highways, who have expedited what is known as a drainage and grading contract for this section so that we may put this particular piece of sewer that has been broken due to failures on permanent fill and in advance of the freeway project over which the right-of-way must of necessity make some modifications in the sewers.

I would like to -- if that is in answer to your question, Mr. Poston, or Mr. Stein --

MR. STEIN: Just a moment. I didn't raise these questions, and I want to summarize them as the chairman.

There were two questions that were raised here: One, is the sewer going -- is the corrective work going to be done? I haven't heard a date yet, except there are complications and that we knew.

Secondly is: What is going to be done to see that we don't have a reoccurrence? Again, if you have easement problems and you can't control the sewer, I am not sure that the assurance of that has come yet. In other words, the two basic questions are: When is the Big Creek sewer going to be put back into operation again; and, are we going to have assurances when it is put into operation that we won't get these recurring breaks?

MR. WOLFS: In response to the first question, we have a contractor working on the sewer at the present time. He expects to be done with this in a matter of two weeks. Is this sufficient answer?

MR. STEIN: Mr. Poston?

Would you repeat that, sir? (Laughter)

J. R. Wolfs

MR. WOLFS: I probably gave the smartest answer given this morning.

I said it would be -- contractors engaged at the present time expect to be done in two weeks.

Next question, and the answer thereto: I indicated the State Highway Department has expedited a drainage contract for this section of the Jennings Freeway which they have assured me would probably be under contract in March of 1970.

We will participate in the construction cost of that which is declared noneligible and the State Highway Department will run the job. That will take care of the problem of this particular break, and the one that has been the most recent.

I referred, by allusion, to the fact that I will turn over to the Secretary our timetable and our construction procedure, particularly for the Southwest Suburban trunk sewer which will take care of the other area that presently traverses a dump area.

I would like to make a summary. The city of Cleveland has continued to annually invest several million dollars of local moneys for new sewers and betterments. Pursuant to State of Ohio rules and regulations, separation of combined sewers is being carried out on all new developments and to the extent possible in urban renewal projects. One sewer alone is $1.2 million.

We are proceeding with the detail plans for $30 million of trunk sewers serving the greater Cleveland area which is to be funded from the $100 million bond fund pending a rate increase and without any Federal funding to date.

Applications have been repeatedly rejected. The program cannot be finalized until matching State and Federal funds are available, and I am particularly addressing myself to the sewer program. Dr. Martin was addressing himself particularly to the plant program.

Local governments do not have the benefit of quick take for right-of-way, and the stated policy of the American Association of State Highway Officials virtually precludes the use of limited access right-of-way for needed sewer routes.

The Bureau of Public Roads is more liberal in regard to limited access roads. If meaningful pollution measures are to be expedited, implementation of right-of-way problems must be resolved.

Finally, property tax rate plus equivalent local income tax in Cleveland is now at $68.46 per thousand dollars valuation based on 40 percent. All pollution implementation is outside, and in addition to the property tax. Local rates must be doubled to support the bond issues.

I thank you. (Applause)

MR. STEIN: Any further comments or questions?

MR. LYON: I have a question, and I am not sure to whom it would go, but it may go to Dr. Martin or to Mr. Eagle.

On Pages 10, 11, and 12, there are three pages of industrial waste discharges in the Cuyahoga River Basin, and Dr. Martin indicated that a study was pending concerning the industrial waste discharges. This, then, raises a question whether this list includes all of the industrial waste discharges, and whether all of the needed information concerning industrial waste pollution abatement on the Cuyahoga River is available or whether additional information still has to be collected.

DR. MARTIN: The industrial waste program which I mentioned was not for the purpose specifically of collecting data, but to design an industrial waste treatment and control system. The study will at the same time include collecting additional data, but the primary purpose of it is to begin to design a system for the control of industrial waste, not specifically to collect data.

MR. LYON: Is this design and its completion to some extent assured by agreements by the industries to connect to this system?

DR. MARTIN: At this time, no, it is not. It stands at very much the same point that the OWDA program stands. It is beginning.

MR. LYON: In other words, we don't know yet how these industries will abate their pollution. They may treat their wastes themselves or they may go into this system.

DR. MARTIN: I think the final answer will be a combination of these things.

MR. LYON: Have schedules for either alternative been submitted, or is that still unanswered?

DR. MARTIN: No, sir, because we don't know what we are going to construct yet.

There is another comment from Mr. Eagle on that.

MR. EAGLE: Yes. We do have schedules from industry, and these schedules are indicated in the report. Up until now they have been going on their own, providing their own facilities.

If the city of Cleveland is going to offer some service in this area, then the plans may be altered. But

I would hope that the schedules would not have to be advanced for the elimination of the pollution.

MR. STEIN: Does that satisfy the question?

MR. LYON: Well, just one question. Suppose the city comes along with a plan of collecting this, will this delay the schedules that have presently been submitted?

MR. EAGLE: I can't answer that. This would be a matter that would have to be acted upon individually by the Ohio Water Pollution Control Board in cooperation with the city of Cleveland, and this would have to be worked out to abate the pollution. I would hope that we would not have to advance these schedules, in any instance.

MR. STEIN: I am going to say this, George, just for clarification.

As I understand this, there is a date that the State has established for the abatement of pollution by the industries discharging into the Cuyahoga River Basin. These are specified industry by industry from the report they have given us.

Now, with every industry, there are always two choices of handling the wastes: either you treat your own and have your own outfall, or you join with a collection system, usually a municipal system.

What Mr. Eagle is saying is that these dates are in force and apply to these industries as individual discharges. However, if the industry and the city will get together with a plan where the city will pick up these wastes, Mr. Eagle and the Ohio authorities will look at that proposal at that time to see if that is a reasonable alternative both in terms of providing for adequate treatment and meeting the time schedule.

Is that a fair statement --

MR. EAGLE: Yes, sir.

MR. STEIN: -- of the situation?

Then, I think -- this is something that is obtained in other places and I think it has worked.

Mr. Metzler.

MR. METZLER: My questions, at this point, would be directed to Mr. Eagle, so if there are others to the speaker, I defer.

George, I have two. I noticed the notations about deep well disposal. Has the Department, or has the State adopted rules and regulations and have a policy with respect to deep well disposal? I recognize that this is an intrastate problem primarily rather than interstate, but I am asking for information.

MR. EAGLE: Yes, sir. First of all, we have a law authorizing this, and the Division of Oil and Gas and the Department of Natural Resources have set up requirements, regulations, and all of these facilities must be reviewed and improved not only by the Division of Oil and Gas and the Department of Natural Resources but by the Division of Geology in the Department of Natural Resources, and the Department of Health, Division of Engineering.

MR. METZLER: How do you make the decision about whether to go to deep well? Is this an option of the industry based upon costs, or is this because you have told them that -- representing the water pollution authority of the State of Ohio -- there is no other satisfactory method of disposal?

MR. EAGLE: There is an option. There are other means, of course. They can have it hauled away somewhere, or they could perhaps in some cases burn it, and there are other options. But they have been ordered by the Water Pollution Control Board to cease and desist the pollution.

MR. METZLER: Well, I don't want to belabor this point, but I did want to understand your philosophy because ours has been that deep well disposal is a place of last resort. It is only to deposit mineralized brines or wastes that can be safely contained and simply cannot be treated and released in the environment any other way -- some of the high level radioactivity is an example.

What I am asking is: Do the people who go to deep well disposal in Ohio do so as a last resort, or do they do it because it is a more economical and alternate method of handling?

MR. EAGLE: I would say the cost in itself makes it a last resort, but I think these programs are carefully reviewed and worked out with the industry and up to date. I would say, Dwight, that it has been a means of last resort.

MR. METZLER: One other quick question: The tabulation, Table II, Appendix 2 refers to in several cases acid wastes being hauled away.

MR. EAGLE: Yes, sir.

MR. METZLER: Where do they go?

MR. EAGLE: Well, I would be glad to give you the details on that sometime. We have a couple of approved disposal areas in the State -- in the northeast part of the State -- where these are hauled.

MR. METZLER: In what? You mean they are disposed on the land or --

MR. EAGLE: No, they are lagooned areas; in contained areas.

MR. METZLER: Thank you very much.

MR. STEIN: Are there any other comments or questions?

Mr. Poston.

MR. POSTON: I note that on Page 5 you have a summary of phosphate removal, and in essence this says that by 1973 you will remove 60 percent of the phosphate, the total loads, 60 percent of the 34,000 total that is put into Lake Erie from the shoreline population.

MR. EAGLE: That is not exactly true, Mr. Poston.

You would have to refer to the tables for the detail on this, but the shoreline -- all of these installations are to be completed by 1973. We already have some in operation, as a matter of fact, but all of them are to be completed by 1973, and on the tributaries all of them are to be completed by 1975.

MR. POSTON: I notice this is expected removal.

MR. EAGLE: We are saying 90 percent, and my experts tell me that there is no question about this 90 percent, and I think Dr. Martin here indicated that he feels he can do considerably better than 90 percent, so this is a minimum figure.

MR. POSTON: Well, I think I was concerned -- previously we had talked about tentatively proposed for the Cleveland plants, and I wondered whether this expected meant that orders had been issued, or there were permits up to that time. What does this word "expected" mean?

MR. EAGLE: In many cases, this is true. So far as the permit conditions and orders of the city of Cleveland is concerned, this is indicated to be tentative, in this report, and this has not been acted upon yet by the Water Pollution Control Board, as indicated a little while ago. It will be, however, within the next two or three months and firm dates set.

MR. POSTON: Well, could conceivably this 1973 or 1975 date be changed then?

MR. EAGLE: Oh, anything is possible, sure, but not probable.

MR. POSTON: Well, I think that is all.

MR. STEIN: Mr. Poole.

MR. POOLE: I have got two brief ones.

Dr. Martin, did I understand you to say that the financing of the additions to the treatment works was not dependent on Federal and State aid?

DR. MARTIN: The question was asked whether the financing of the program depended on Federal aid, and my answer was, "No, it does not."

MR. POOLE: May I assume, then, that your financing does depend on the State aid as outlined by Mr. Williams?

DR. MARTIN: Yes, sir.

MR. POOLE: As I understood that was a combination of Federal and State aid -- technicating a little bit with you now.

DR. MARTIN: With the State of Ohio prepared to spend $450-$500 million, and the city of Cleveland alone $100 million, the contribution from the Federal Government to the tune of $10 million per year is somewhat ludicrous. (Laughter and applause)

I think I can safely make the statement, sir, that our program in this State and in this city does not depend on Federal aid.

MR. POOLE: My second question is: You have mentioned eventually tertiary treatment or advanced waste treatment at the Southerly Works. What are you shooting for in terms of B.O.D. removal?

DR. MARTIN: We have, at the Southerly Plant, an activated sludge secondary treatment plant. As such, we expect that the B.O.D. removals, at that plant, will be what the conventional removals are from that kind of a facility: somewhere between 80 and 85 percent.

MR. POOLE: But the book here says advanced waste treatment by a certain date. That is what I am --

DR. MARTIN: The phosphorus removal, I believe, is in the category of advanced waste treatment. Any treatment process, or any treatment advance which we make, has been defined by the Federal Water Pollution Control

Administration as advanced waste treatment if it is not a part of conventional primary and secondary treatment.

MR. POOLE: In other words, what you are thinking of, then, as advanced treatment is phosphate removal.

DR. MARTIN: Yes, at the Southerly Plant.

MR. EAGLE: I would like to elaborate on that, Dr. Martin.

I think this came in the report as the result of the Havens and Emerson report of a year ago, and I think they did propose some form of advanced waste treatment at the Southerly Plant. I don't recall what it was, but it was tertiary type treatment, and I guess you are reconsidering this proposal at this time.

DR. MARTIN: Yes, sir. The proposal in the report was for lagooning. We are considering other alternatives because of the land requirements associated with lagooning, and we are considering specifically chemical removal, either by activating alumina or by lime treatment.

MR. LYON: I hate to add to the confusion, but earlier you said, or I think maybe George said, that this advanced waste treatment listed on Page 7 under Cleveland Southerly area did not include phosphate removal because that says 1975; and you said earlier that your phosphate removal would be in by 1973.

So I think it would help us all if you could clarify that date, because on Page 7, the Southerly area advance waste treatment facilities are listed as being completed by 1975.

DR. MARTIN: Yes. Let me make a general explanatory comment here. We are right in the middle now of negotiating with the Ohio Water Pollution Control Board over a new permit, and this is the reason for some of the apparent confusion. There isn't any really.

The 1975 date, which Mr. Eagle put in this report, was the result of an engineering report which we had previously done, which was primarily associated at the Southerly Plant with the lagooning alternative. Now, since we have taken a new look at this, we are proposing to the State actually schedules at Southerly and Easterly which are in advance of those previously discussed schedules, and these are associated with 1973, so that there are two things going on here at the same time.

Again, we are in the middle of discussing the permit application -- formal permit application from the State of Ohio for the city of Cleveland with the Ohio Water Pollution Control Board, and this has not been acted upon at this point in time. This is the reason why it came up before -- a tentative date of 1973.

MR. LYON: I think that clarifies.

MR. STEIN: Are there any other questions or comments?

If not, I should like to make just a last comment, because I think we are in a phase here of trying to get to the nuts and bolts of the pollution problem. Sometimes the kinds of statements we get from the people in the audience reflect a shift. But because we are just putting the pieces together, and before we let the metaphysics assume the role of reality -- I know we have a lot of fun when we talk about the small Federal contribution being ludicrous, as one of the speakers said -- let me state the real situation here. When I first went out, before there was Federal aid, and looked at the Cuyahoga River, the condition of that river was so ludicrous I could cry. The law is very plain on this: The people responsible for their pollution have to bear the expense and are legally and technically responsible for cleaning it up.

Whatever you say about this other business -- and this is fine, and that is why we Feds are here, for you to stick pins in us -- but the point is: just remember what the basic law is. If you are putting out that mess, you are legally and technically responsible for cleaning it up, and if this is an interstate pollution case, the

Federal regulatory agencies have a duty to see that this is done, and if it is a State matter, the State regulatory agencies have the same function.

With that, I think we can all go back to our fun and games.

Are there any other comments? If not, we will stand recessed for lunch until 2:00 o'clock.

(Noon recess.)

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G. H. Eagle

AFTERNOON SESSION

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MR. STEIN: We will reconvene.

Mr. Eagle, will you continue with the Ohio presentation?

MR. EAGLE: Thank you, Mr. Chairman, Conferees.

Ohio has a number of recommendations they would like to make to the Conferees which are sort of over and above and beyond what the progress report is.

Starting on Page 7 of my report, I reported at the October 4, 1969, Session of the Conference that the Division of Engineering of the Ohio Department of Health had appointed an ad hoc Advisory Committee on Algae Control in Lake Erie made up of experts in water supply, wastewater treatment, analytical techniques, limnology, and agriculture drainage.

The division charged the committee with these responsibilities:

1. What methods of reduction of phosphate are available for municipal and industrial wastewater treatment plants? What are efficiencies and costs?

2. What reasonable demonstration projects could be adopted which would determine the effectiveness of such treatment projects in reducing or eliminating

algae?

3. What information is available on the role of agricultural drainage in causing undesirable algal growths in Lake Erie and what can be done to provide controls, if necessary, over such drainage?

4. What analytical program should be undertaken to fully assess all factors involved in algal growths in western Lake Erie?

The committee divided up the work and gave the subcommittees authority to contact outside experts. Each of the subcommittees learned that while much has been said in their respective areas, little has been summarized and evaluated in a form to permit easy understanding by government officials and the public.

The committee has emphasized the necessity to provide effective controls and to this end has summarized the information available in each of the four areas of interest and has recommended specific guides for action.

I wish to report the following progress and recommendations in each of these areas of interest:

Phosphorus Removal. The committee has prepared a comprehensive manual of various phosphorus removal processes listing applications and cost factors. This manual is intended as an easy reference for general information for designing engineers and operators. It will be published and distributed by the Division of Engineering in the near future.

Demonstration Project. (See Report) The State of Ohio urges the development of demonstration projects such as those proposed by the subcommittee. The States and Federal Government should encourage and assist, as much as possible, local initiation of the projects. As pointed out by the subcommittee, only in a few cases has there been any observation of the relative effect of treated effluent in stimulation of algal growth in the receiving water. It is imperative, in our opinion, that several such observations be made in the Lake Erie Basin.

You do have, in your packet of stuff that I gave you, a copy of this report on the Demonstration Project.

Now, I would like to call on Mr. James E. Frook, who is the Superintendent of the Toledo Division of Sewage Disposal, who was a member of the committee which developed this report to explain the findings and recommendations more fully.

Mr. Frook.

STATEMENT OF JAMES E. FROOK, COMMISSIONER OF SEWAGE DISPOSAL, TOLEDO, OHIO

MR. FROOK: My name is James E. Frook, and, for the record, I would like to make a small correction. I am Commissioner of Sewage Disposal of the city of Toledo, not the Superintendent. I would like the record to show this correction.

MR. EAGLE: Okay.

MR. FROOK: The committee has already copies of this report for the Conferees.

(Mr. Frook read the following report.)

PROPOSED DEMONSTRATION PROJECTS FOR DETERMINING EFFECTIVENESS OF WASTEWATER TREATMENT IN REDUCING ALGAE IN LAKE ERIE WATERS

Prepared by: SUBCOMMITTEE ON DEMONSTRATION PROJECTS

George D. Simpson, Chairman, Havens & Emerson
Consulting Engineers, Cleveland

James E. Frook, Supt., Toledo Division of
Sewage Disposal

James C. Haube, Chief Chemist, Toledo Division of
Sewage Disposal

John E. Kinney, Consultant
Ohio Department of Health

Presented to:

OHIO DEPARTMENT OF HEALTH
AD HOC COMMITTEE ON ALGAE CONTROL
IN LAKE ERIE

May 20, 1969

REPORT OF SUBCOMMITTEE ON A DEMONSTRATION PROJECT

INTRODUCTION

Many of the existing studies on the relation of phosphate and algae have been based on the assumption that phosphorus is the critical element in the system, and that reduction of phosphate content to low concentrations will effectively control algae growth. Consequently, the data collected and the investigations made to date have concentrated on the mechanism of phosphate removal in the treatment process, and the relative merits of various processes under investigation have been measured only by percent phosphate removal. Only in a few cases has there been any observation of the relative effect of the treated effluent in stimulation of algal growth in the receiving water. Some work along this line has been done in Wisconsin by the University of Wisconsin group, and some work has been done in laboratory studies by Rand and Nemerow at Syracuse University. These studies provide valuable guidance to techniques used in study of this question and to future research and observation.

However, it is clear that research and demonstration available to date is not adequate to permit quantitative evaluation of the effectiveness of phosphate removal in controlling algal blooms. As stated by Rand and Nemerow, et. al.,* "... the previous investigators worked with sewage treatment plant effluents for coagulation tests, and no one, after determining removal efficiences of the two coagulants, has ascertained whether or not the treated effluent would support algal growth. It does not seem sufficient and complete to say that a certain type of treatment process will remove X percent of the phosphorus and Y percent of the nitrogen without determining what effect the removal has on receiving waters".

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*"Removal of Algal Nutrients from Domestic Wastewater, Part II, Laboratory Studies". Research Report No. 11, New York State Department of Health, prepared by Syracuse University, March, 1965.

Precise correlations of the effects of phosphate levels in the natural environment are difficult to make. Many variables are at work in natural bodies of water which make it extremely difficult to distinguish the critical factors governing algal growth at any given time. For this reason it appears that such an investigation in the main body of Lake Erie is not feasible except over the entire Lake over a period of many, many years.

One of the principles of scientific investigation is that experimental work be designed to reduce the number of independent variables to the minimum, if possible to a single variable. Under such conditions, valid relationships might be established for a series of variables in turn, which could subsequently be combined in various ways. The demonstration project proposed is an attempt to set up conditions where phosphate concentration is the only significant independent variable and to observe the effects of algae population and growth resulting therefrom.

The Subcommittee first considered a demonstration project in which two streams of effluent from a sewage treatment plant would be impounded in two parallel storage basins or lagoons. The treatment plant would practice a split treatment process such that one effluent stream would be given a high degree of phosphate removal in the treatment processes, while the other stream would undergo normal sewage treatment without special phosphate removal. The concentration of phosphate in the treated stream entering one lagoon would be controlled to desired levels by operating the treatment devices and/or by diluting the treatment effluent in various proportions with Lake Erie water.

Observations would be made in the two lagoons regarding the algal growth rate and total concentration of algae in relation to the concentration of phosphorus present, with the objective of determining the effect of from 80% to possibly 99% removal of phosphate from sewage.

This plan was considered in detail by the Subcommittee with the advice of several outside experts in algology and nutrient control. After thorough consideration the Subcommittee believes that this plan holds very little promise of producing fruitful results, and would probably not be capable of developing the reliable cause and effect relationships desired. There are several defects to this plan, which may be generally categorized in two groups as follows:

(1) It would be difficult or impossible to reach sufficiently low concentrations of phosphate in either of the lagoons to prevent or control algae blooms.

(2) Manipulation of the treatment plant processes and dilution of treatment plant effluent in order to achieve desired phosphate levels inevitably entails changes in other variables, such as pH, nitrogen levels, and other elements of the water chemistry which make it impossible to be sure that differences observed are due only to differences in phosphate level.

For these and other reasons this demonstration plan is not recommended.

A second and somewhat different plan was evolved which overcomes some of these objectives and seems to offer sufficient promise of useful results to warrant consideration. It differs from the rejected plan in that natural Lake Erie water would be tested as well as treated plant effluent. This proposed plan is detailed below.

OBJECTIVES OF PROPOSED DEMONSTRATION PROJECT

The objectives of the project are:

(1) To establish conditions in which phosphate levels in Lake Erie water and in a treated sewage effluent can be varied in comparison with a control water containing very low normal phosphate concentrations.

(2) To discharge the test streams and control stream into identical parallel impoundments or lagoons and to observe the difference in algal population and growth in each.

(3) To observe the effects on algae growth of varying the phosphate input to the test lagoons, and to attempt to determine the critical phosphate levels at which algae blooms occur. If the term "bloom" can not be adequately defined, then the observations would be expressed as relative concentrations of algae corresponding with various levels of phosphate concentration.

(4) To observe changes in algal species resulting from different phosphate concentrations.

(5) To observe the effects of recycle of precipitated materials from the bottom sludge, due to seasonal or physical turn-over of the impoundment.

(6) To observe the difference in chemical and physical characteristics of the water in the test and control impoundments brought about by differences in algae population, such as alkalinity, carbon dioxide, dissolved oxygen, various forms of nitrogen, and so forth.

It is recognized that the results may not correlate with great precision, and that the validity of the results may be generally limited to water similar to that tested under Lake Erie climatic conditions. However, considering the importance of the subject and the present condition of the lake, the potential value of the project seems to warrant the effort and expense.

DESCRIPTION OF THE PROPOSED DEMONSTRATION

1. Select one or more treatment plants along the shore of Lake Erie at

which phosphate removal could be practiced in the treatment process.

2. Three test lagoons of identical size and shape would be constructed. (See attached diagram). Lagoon 1 would receive treatment plant effluent, which may or may not be diluted by the addition of natural Lake Erie water. Lagoon 2 would receive natural Lake Erie water enriched to the desired phosphate concentration by the direct addition of chemical phosphate only. Lagoon 3 would receive only natural Lake Erie water, and would constitute the control lagoon. Lagoons 2 and 3 would provide a direct comparison of Lake Erie water without sewage effluent and permit comparison of algae growth at different and precisely controlled concentrations of phosphorus. Lagoon 1 would permit a comparison of algae growth in treatment plant effluent at various phosphorus concentrations with growth in Lake water. By this plan, phosphate level in Lagoons 2 and 3 could be brought to the level of the background concentrations phosphorus in Lake Erie, which at most times is probably below the critical concentration necessary for algae blooms.

3. If it were found that levels of nitrogen or other nutrients in Lagoons 2 and 3 were deficient to support algae growth, such nutrients could be added equally to all lagoons without changing the validity of comparison of phosphorus.

4. The algal growth rate and concentration would be measured by one or more of these techniques in each lagoon:

   (a) Centrifuged solids concentrations.

   (b) Volatile suspended solids.

(c) Respirometer test of growth rate.

(d) Light transmission or turbidity.

(e) Algal density by fluorometric determination of chlorophyll A and B.

5. Changes in algal characteristics and species should be observed.

6. All significant parameters of water quality should be measured on both influent and effluent and at different depths within all three lagoons, including but not limited to all forms of phosphorus, nitrogen cycle, alkalinity, BOD, solids, plankton counts, carbon dioxide, and hardness. Monitoring of chlorophyll A and B, DO, pH and temperature would be included. Trace elements would be determined on a low-frequency schedule. Periodic examination of the quantities and characteristics of the bottom sediments would be made.

7. The effects of recycle of precipitated phosphorus from bottom sediments or accumulated sludge could be controlled as desired by sealing the bottom from overlying water by use of plastic sheets or by placing a layer of clean sand over the bottom at periodic intervals, or by sludge removal. At other stages of the experiments, the effects of mixing and recycle bottom sediments could be observed by artificial or natural mixing.

8. The detailed study plan and design of the demonstration system should be prepared with the advice of a board of experienced algologists, who should periodically review results and suggest modifications or additions to the test program. For this reason, a detailed testing program has not been prepared. The Subcommittee believes however that the following general principles would describe minima for the design:

(a) Flow rates should approximate .5 mgd to each lagoon.

(b) In order to cover adequately the effects of cyclic changes in the background lake characteristics, the project should be planned to extend for a minimum of three years.

(c) Detention period in each lagoon should be sufficient to minimize effects of rapid fluctuations in lake water quality and to permit the establishment of reasonably steady state conditions. A minimum detention period of about 35 days in each lagoon is suggested for consideration.

(d) Testing should continue year-round to observe changes brought about by temperature and climatic conditions.

(e) Lagoon depths should be adequate to reduce the effects of mixing by wind and waves, and to simulate a natural lake condition in which a significant proportion of the water is not exposed to sufficient light for photosynthesis.

COST OF DEMONSTRATION

Accurate estimates of cost cannot be prepared until the test program is designed in detail. Preliminary estimates based on the Subcommittee's general assumptions indicate that a 3-year demonstration program cost would be in the range of $650,000 to $750,000. These figures include construction, cost of phosphate removal at the treatment plant, laboratory work, data evaluation, and consulting services. Costs do not include allowances for land.

CONSIDERATION OF ADDITIONAL DEMONSTRATION ON STREAMS

The proposed demonstration project described above is concerned with Lake Erie water. The Ohio Department of Health is also responsible for developing policy on phosphate removal in intrastate streams not in the Lake Erie basin.

The Subcommittee suggests that consideration should also be given to possible demonstration projects on selected streams, such as:

1. Diverting phosphate-rich flows (e.g. a treatment plant effluent) into a non-algae producing stream to observe the effects, or,
2. Diverting phosphate-rich flows away from a stream presently subject to algae blooms, or,

3. Split-flow treatment of half a stream flow for phosphate precipitation, to observe the effects, if any.

This subject has not been developed in any detail, but the Department of Health might consider various streams suitable for demonstration projects, so as to develop a basis for stream standards on phosphates, applicable to streams both within and outside the Lake Erie basin. It should be recognized that the proposed demonstration project on Lake Erie water would not evaluate effects of phosphate levels on tributary streams, nor the effects of nutrient-rich streams on Lake Erie. The importance of these subjects is not to be minimized, but the Subcommittee feels that these topics were outside the scope of considerations requested.

Respectfully submitted,
Demonstration Subcommittee:

P.J. Weaver*
James E. Frook
James C. Haube
John E. Kinney
G.D. Simpson

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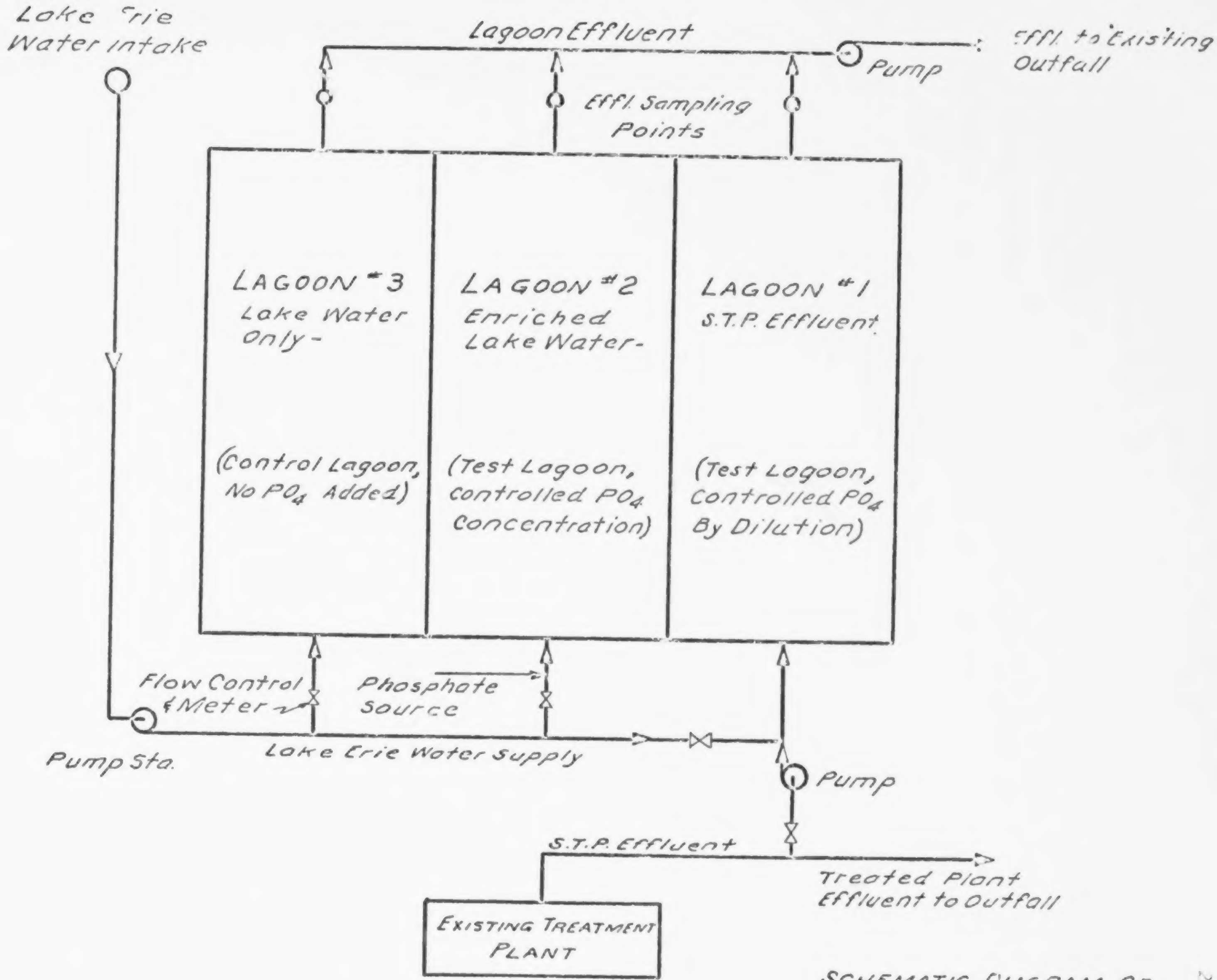
*Served on the subcommittee until December, 1968.


Lake Erie Water intake
Lagoon Effluent
Pump
Effl. to Existing Outfall
Effl. Sampling Points
LAGOON #3
Lake Water Only -
(Control Lagoon, No PO4 Added)
LAGOON #2
Enriched Lake Water -
(Test Lagoon, controlled PO4 Concentration)
LAGOON #1
S.T.P. Effluent
(Test Lagoon, Controlled PO4 By Dilution)
Flow Control & Meter
Phosphate Source
Pump Sta.
Lake Erie Water Supply
Pump
S.T.P. Effluent
Treated Plant Effluent to Outfall
EXISTING TREATMENT PLANT

SCHEMATIC DIAGRAM OF PROPOSED DEMONSTRATION PROJECT

MR. EAGLE: Thank you, Jim.

Does anybody have any questions of Mr. Frook before he leaves, as far as his report?

I want to make it clear that we are not talking about delaying anything until these studies are made, but we think that these studies are very important, and that they should go along concurrently with improvements that are being made in regard to algae control in Lake Erie.

MR. STEIN: Mr. Lyon. Just a moment.

MR. LYON: Mr. Chairman, I think this is a very worthwhile project.

George, have these gentlemen been in touch with the Ontario Water Resources group and the others who have also had some studies in this field? I don't think any of them have been as thorough as this one proposes to be, but it probably would be well worthwhile.

MR. EAGLE: I am going to ask Mr. Frook if he knows.

I think Mr. Simpson, who was chairman of this committee and unfortunately couldn't be here today -- I think that he has had contacts with Ontario, but how extensive I don't know.

Do you know, Jim?

MR. FROOK: No, I do not know, and the only other member of the committee here today is Jim Haube. Do you know at all, Jim?

MR. HAUBE: He is aware.

MR. LYON: The Canadians have done quite a bit of work, and it might be well worthwhile to exchange notes, but this certainly looks like a real fine project.

MR. EAGLE: Now, with regard to our agricultural drainage -- and you have a copy of our report in your packet from Ohio.

Ohio is urging the agricultural interests in the State through the Director of Agriculture, who is a member of the Ohio Water Pollution Control Board, to study the land runoff of silt and nutrients, particularly phosphates, and to develop or expand such programs as are necessary to reduce this runoff. For your information and use, if you so desire, I am submitting a report prepared by the committee to you. I think you will all agree that much more work needs to be done in this area in the future. I sincerely hope Ohio can move forward with a meaningful program.

Certainly, if the municipalities and other discharges in the Lake Erie Basin in Ohio are to spend $6 to $7 million a year, or possibly more, for phosphate removal, they have a right to know how much good they are doing in improving the water quality. Further, only by continuing sampling and surveillance can a predictive model for water quality management in Lake Erie be refined to meet the needs of the times.

The data collection and surveillance program recommended by the committee and by the Ohio Department of Health and Water Pollution Control Board is considered to be a minimum program. The estimated cost of about $2 million the first year and somewhat less the following year is not unreasonable, in our opinion, for providing this essential data. Such a program should be started at once and should be funded mostly by the Federal Government in accordance with the Lake Conference Recommendations and Conclusions.

I am now going to ask Mr. James C. Haube, Chief Chemist of the Toledo Division of Sewage Disposal, also from Toledo, who was chairman of this committee, to give you a more detailed explanation of the recommendations contained in this report.

Mr. Haube.

STATEMENT OF JAMES C. HAUBE, CHIEF
CHEMIST, TOLEDO DIVISION OF SEWAGE
DISPOSAL, TOLEDO, OHIO

MR. HAUBE: I would like to project two transparencies of the Western Basin and the Lake as an entire system.

I hope you will excuse the confusion we will have in the next few minutes while we get this projector set up.

(Mr. Haube read the following portion of his prepared report.)

PROPOSED DATA COLLECTION AND SURVEILLANCE PROGRAM FOR WATER QUALITY MANAGEMENT IN LAKE ERIE

Prepared by:

Subcommittee on Data Collection and Surveillance

James C. Haube, Chairman
Chief Chemist, Toledo Division of Sewage Disposal

Ernest Neal, Eng.Tech - Biologist
State of Ohio Department of Health

John E. Kinney, Consultant
State of Ohio Department of Health

Presented to:

State of Ohio Department of Health
Ad Hoc Committee on Algae Control in Lake Erie

May 20, 1969

INTRODUCTION

The program for data collection and surveillance in Lake Erie, as proposed by the Subcommittee on Data Collection and Surveillance and outlined later in this report, has been designed after logical consideration to the following guidelines which it feels are fundamental to the success of any stream surveillance program:

1. The program must be responsive to the needs of decision makers; needs which frequently vary in time and character. Likewise, the decision maker must provide prompt response to newer methods of surveillance and changing surveillance needs.
2. The program must be, above all, comprehensive enough to meet the need and include both continuing and dynamic surveillance systems which will acquire conclusive chemical, biological, and physical water quality data sufficient to establish factual interrelationships rather than general trends.
3. The program must provide for a planned acquisition of factual information which is commensurate with cost and effort involved.
4. The program must be capable of being continued over an indefinite period of time and further, be capable of withstanding modifications without interruption of system efficiency.
5. The program must allow for constant critical evaluation to ensure a valid choice of information sought and best procedures to obtain it.
6. The program must provide for minimum delay in data processing through optimization of all data management systems so maximum use of acquired data can be realized.

PROGRAM OBJECTIVES

The data collection and surveillance program outlined later in this report has been designed to achieve the following six objectives:

1. Establish phosphorous (as well as other related water quality parameters) concentrations and distribution throughout Lake Erie and at the points of discharge of major tributaries.
2. Establish phytoplankton population densities and their distribution throughout Lake Erie and at points of discharge of major tributaries.
3. Record instances of phytoplankton "bloom" growths as to location, composition, extent, and duration in Lake Erie and to appraise chemical and physical conditions preceeding, during, and following "bloom" growths so as to permit development of interrelationships and suggest control measures.
4. Appraise major tributary loads and flow to Lake Erie with consideration to composition, distribution, and ecological changes effected by such.
5. Appraise effects of siltation in Lake Erie and determine, on a quantitative basis, the rate of siltation in Lake Erie with consideration given to composition and the distribution of bottom deposits.
6. Obtain sufficient multiparametric data of a factual nature to permit development of models for Lake Erie.

THE DATA COLLECTION AND SURVEILLANCE PROGRAM

The combined data collection and surveillance program outlined in this report calls for the intergration of three separate and distinct subprograms. Each subprogram should be incorporated into the whole for best efficiency. The three subprograms are as follow:

1. In-Lake Automated Monitoring
2. Manual Sampling and Examination
3. Additional Data Acquisition

It is not considered likely, for financial reasons, that both an intensive and comprehensive study of the entire Lake Erie is possible at this time or in the foreseeable future. Attempts to apply a budget limited study to the entire lake would tend to be self-defeating as factual, multiparametric data could probably not be realized.

To overcome this inherent difficulty, the proposed Data Collection and Surveillance Program calls for the direction of major investigative effort to those sectors of Lake Erie which have been most effected by processes of pollution and eutrophication (i.e., Western Basin). However, considerable attention has been provided by the Data Collection and Surveillance Program for the remaining sectors of Lake Erie. Although this practice is not beyond scientific reproach, it is considered probable that the majority of data acquired, as well as interrelationships which are developed, through intense study of the Western Basin would apply to the remaining sectors of the lake.

MR. STEIN: Pardon me. Do you intend to read this whole paper?

MR. HAUBE: Do you intend to listen to this whole paper, Mr. Stein?

MR. STEIN: If you intend to read it, we sure intend to listen to it.

MR. HAUBE: Okay.

MR. STEIN: Well, do you care to answer the question?

MR. HAUBE: I think you are letting the page numbers frighten you. There are eighteen pages here, but it is in outline form, and it is going to move very rapidly. There are some sections I intend to leave out. I certainly think it is worthwhile.

MR. LYON: Mr. Chairman, may I suggest that we be given a chance to review this paper at our own leisure? It has got a lot of detail in it. I am sure it is very worthwhile, but we have a number of other items on the agenda. I wonder if we couldn't have this paper summarized.

MR. STEIN: Well, I am not going to cut anyone off, and this is up to Ohio and Mr. Eagle to proceed in their own way. In other words, any material that you think is relevant, we are going to accept.

Will you just go ahead and, in view of these comments, proceed in the way you think best?

MR. HAUBE: Okay, fine. I will just attempt to, then, in five minutes, sum up this paper, and hope that it is reviewed in detail before the next reconvening of the conference.

The in-lake automated monitoring system which we have called for has been deemed necessary for the following reasons:

To appraise the flow patterns throughout Lake Erie especially with the flows communicating between the Central and Western Basins, and between the Central and Eastern Basins.

We also are interested in monitoring to appraise the zones within Lake Erie which are significantly influenced by tributary discharges.

In this report, we have called for a maximum of 22 monitoring sites in the Western Basin of Lake Erie, eight monitoring sites in the Central Basin, five monitoring sites in the Eastern Basin.

Parameters for automated monitoring which we consider critical are dissolved oxygen, temperature, pH, specific conductance, solar intensity, chlorophyll, apparent turbidity.

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We also consider carbon dioxide, ammonia nitrogen, nitrite nitrogen, nitrate nitrogen, alkalinity, and phosphorus as critical paramaters. However, we realize automated monitoring systems, sophisticated enough to analyze for these parameters, are not currently available. We do recommend that once these systems are available that they be implemented into the program.

The second sub-program, Manual Sampling and Examination, as I have mentioned before, the major emphasis has been placed on the Western Basin for obvious reasons.

We call for a series of from 50 to 70 surveillance stations to be located in the Western Basin along a grid having intervals initially of five miles.

In the Central Basin, we have also called for constructing 22 sites for manual sampling and examination.

In the Eastern Basin, likewise, we have asked for eight sampling stations to be set up.

Without workable flow models, chemical and biological models of Lake Erie, it is very difficult to accurately define where surveillance stations should be located. As a result, we felt it necessary to set up these obviously numerous surveillance sites to obtain

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the data which would in turn enable construction of highly accurate model systems which in turn will supplement the data and surveillance program and suggest ways of improving the surveillance program. perhaps eliminating, changing position, or actually increasing the number of surveillance stations.

The program for manual sampling and examination -- we have suggested bi-daily sampling at each of the proposed 80 to 100 surveillance stations, with a maximum sampling of three times per seven-day week, at a depth representing surface waters.

We also recommend once weekly at one-half of the 40 or 40 to 50 of the proposed surveillance stations sampling of the depth representing the mid-depth and bottom waters.

We are also recommending that all manual sampling be conducted by or from helicopter, as well as all transportation of all the collected water specimens. We feel that the use of helicopters is required because sampling must be direct and concurrent at all of the surveillance stations for development of actual or accurate data.

Such frequent and concurrent sampling cannot be achieved by surface craft. We also feel the use of helicopters is indicated in order to delay or to eliminate delays in sampling in examination, to reduce the effects of change in the Lake Erie environmental system, and maintain integrity of the data. Also, it is obvious that adequate number of surface craft are not available to meet the needs and the demands of this particular surveillance program.

Further, surface craft are limited to the factors of speed, navigability, cost, maintenance, and so on.

It is recommended that the following parameters be determined on all water samples collected at these surveillance stations: air and water temperature, wind direction and velocity, water surface characteristics, solar intensity, barometric pressure, dissolved oxygen, turbidity, conductivity, chlorophyll A plus B, pH. These parameters could and would be tested at the time of sample collection to determine at the base laboratory the following parameters: phosphorus series, nitrogen series, total organic carbon (in lieu of BOD and COD), total solids, suspended and/or dissolved solids, chloride, sulfate, fluoride, silica, hardness (total), buffer capacity (potentiometric titration of alkalinity), sodium, potassium, plankton (total and differential counts), carbon dioxide.

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We also recommend that portions of all water samples collected be centrifuged and filtered through membranes with an average porosity no greater than 0.8 microns, and that these be cataloged and stored in a surveillance bank.

The provisions of such a surveillance bank would allow the investigator to look back in time to observe constituents present in the samples taken which at the time were not on his list of required analyses.

It is further recommended that, on a less frequent basis -- perhaps on a once monthly basis -- that selected samples be analyzed for trace elements: zinc, cadmium, arsenic, boron, iron, molybdate, manganese, aluminum, berylium, copper, silver, nickel, cobalt, lead, chromium, vanadium, barium, strontium.

We feel this is necessary because past data to date has not adequately defined the role of trace elements as possible sources of micronutrients for phytoplankton.

In addition to the sub-programs of in-lake monitoring, and sampling and examination, we suggest additional data acquisition systems. Under this program, we recommend provision of a surface vessel for surveillance purposes. Such a vessel is indicated and could be used

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for extended in-depth study of physical, chemical and biological parameters at areas where automated monitoring systems are not available or feasible. Such a vessel would also allow *in vivo* and *in situ* analyses of parameters not able to be automatically monitored. It would also extend the flexibility of the sampling and examination program.

Two problems considered as possible assignments for this surveillance vessel:

1. Define the nutritional status of phytoplankton in Lake Erie and at points of discharge of major tributaries.

2. Define the rate and ecological effects of sediment deposition in Lake Erie and at points of discharge of major tributaries with special emphasis on the problem as it exists in the Western Basin.

With regard to the surveillance vessel, we also indicate a need for the staff of such research or surveillance vessel to utilize bioassay techniques to determine physiological effects of algae and metabolic systems in algae.

Such procedures, bioassay procedures as nitrogen uptake rate by NH_4-N absorption, nitrogen fixation rate, orthophosphate extraction for determination of limiting or surplus phosphorous content, and alkaline phosphatase activity as a measure of surplus phosphorous content is surely indicated.

These techniques have been developed and have been used both in the laboratory and in the field with success.

Also, a possible assignment for the surveillance vessel is a quantitative appraisal of the problem of siltation in the lake. We have several approaches outlined. I don't want to take too much more time. We can skip over this, and go to a next possible program for acquiring additional data.

This would be the Water Intake Surveillance System. Perhaps one of the simplest and yet most highly effective methods of acquiring water quality data for Lake Erie could be realized by enlisting the assistance of water treatment facilities which are located along the perimeter of Lake Erie. This assistance could be both in the form of provision of water samples from the intake, chemical and biological analyses of water samples from the intake, or both.

A cooperative program such as this has been and is in effect in the State of Ohio, in cooperation with the FWPCA.

Another possible source of additional data acquisition would be Tributary Stream Surveillance Systems.

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It is recommended that surveillance systems be designed to characterize wastewater and land runoff loadings to streams tributary to Lake Erie and further, that data generated from such surveillance systems be made available to the proposed Data Collection and Surveillance Program staff. Such data are required if flow pattern and sediment deposition studies are to be effective.

Thank you. That is all I am going to say about this.

(The remainder of Mr. Haube's report in toto follows.)

OUTLINE FOR THE PROPOSED PROGRAM OF DATA COLLECTION AND SURVEILLANCE

I. In-Lake Automated Monitoring

A. It is recommended that an in-lake automated monitoring system be established throughout Lake Erie to collect, on a continuous basis, water quality and physical data.

Selection of automated monitor installation sites, as well as parameters to be automatically monitored, has been done under the assumption that neither a workable flow model nor a comprehensive infra-red thermal mapping of Lake Erie currently exists. Such a model and/or thermal mapping would eliminate much of the trial and error approach inherent in estimation of required sites and parameters.

Stations selected for installation of automated monitors should permit the following:

1. Appraisal of flow patterns throughout Lake Erie with emphasis on flows communicating between the Western Basin and Central Basin and between the Central Basin and Eastern Basin.
2. Appraisal of flow patterns through the three major passages of the Western Basin (i.e., Pelee, Middle, and South Passages) and around the Lake Erie Islands.
3. Appraisal of zones within Lake Erie which are significantly influenced by tributary discharges.

[W B plate]

B. The following sites are considered suitable for installation of automated monitoring systems:

WESTERN BASIN

1. Pelee Point (Canada)
2. Pelee Island (Canada) at Mill Point
3. Pelee Island (Canada) at Fish Point
4. Pelee Island (Canada) at Lighthouse Point
5. Pelee Island (Canada) at Sheridan Point

I. In-Lake Automated Monitoring cont'd.

6. Middle Island (Canada)
7. Kelley's Island (Ohio) at northeastern point
8. Kelley's Island (Ohio) at northwestern point
9. Kelley's Island (Ohio) at Carpenter Point
10. Kelley's Island (Ohio) at southeastern point
11. Marblehead Light (Ohio)
12. Catawba Island (Ohio) at Scott Point
13. South Bass Island Light (Ohio)
14. North Bass Island (Ohio)
15. Green Island (Ohio)
16. Rattlesnake Island (Ohio)
17. West Sister Island (Ohio)
18. Middle Sister Island (Ohio)
19. East Sister Island (Ohio)
20. Toledo Harbor Lighthouse (Ohio)*
21. Point aux peaux (Michigan) at Stoney Point
22. Detroit River Light (Michigan)*

[Gen Plate]

Installation of automated monitors at the above proposed sites would allow for stationary installations at areas where, with only two exceptions, power is currently available. Data from the automated monitors (stationary) could be retrieved manually or telemetered to the central laboratory.

CENTRAL BASIN (approximate locations)

1.	41°50' N. Lat.	82°25' W. Long.
2.	41°35' N. Lat.	82°25' W. Long.
3.	42°05' N. Lat.	81°40' W. Long.
4.	41°45' N. Lat.	81°40' W. Long.
5.	42°20' N. Lat.	81°00' W. Long.
6.	42°05' N. Lat.	81°00' W. Long.
7.	42°25' N. Lat.	80°10' W. Long.
8.	42°18' N. Lat.	80°00' W. Long.

Installation of automated monitors at the above proposed sites in the Central Basin would, by necessity, be of a temporary nature such as the telemetered buoy monitors developed for the F. W. P. C. A.

EASTERN BASIN (approximate locations)

1.	42°35' N. Lat.	79°55' W. Long.
2.	42°30' N. Lat.	79°30' W. Long.
3.	42°46' N. Lat.	79°15' W. Long.
4.	42°38' N. Lat.	79°10' W. Long.
5.	42°46' N. Lat.	79°00' W. Long.

* more than one automated system required.

I. In-Lake Automated Monitoring cont'd.

C. Wherever indicated and physically possible, automated monitoring systems should be installed and programmed in a manner permitting sequential examination of:

1. Near-shore (shallow) waters
2. Off-shore (deep) waters
    a. phototrop~~h~~ic zone
    b. subphototrop~~h~~ic zone

Such examination is considered necessary as present data on Lake Erie, especially the Western Basin, do not define possible stratification of intralake and tributary streams. Examination of water at different depths will provide data for development of vertical profiles.

D. The following parameters have been considered for automated monitoring at all installation sites:

1. Dissolved oxygen (automated monitor available)

    a. to measure diurnal changes which are indicative of phytoplankton activity.

    b. to measure oxygen reduction at shore areas; such may be coincident with or following "bloom" growths.

    c. to assist in mapping flow patterns.

2. Temperature (automated monitor available)

    a. to measure level and duration of water temperature; generally considered a probable "bloom" triggering factor.

    b. to measure influence of warmer shore waters and discharges.

    c. to evaluate suceptibility of shallow water areas to increased algal activity.

    d. to assist in mapping flow patterns.

I. In-Lake Automated Monitoring cont'd.

D. cont'd.

3. pH (automated monitor available)

   a. to measure secondary effects of algal activity.

   b. to assist in detection of "slug" discharges from tributary streams.

   c. to assist in evaluating the role of carbon dioxide in triggering "bloom" growths when correlated with data for alkalinity and buffer capacity.

   d. to assist in mapping of flow patterns.

4. Specific conductance (automated monitor available)

   a. serve as a relative measure of dissolved solids content.

   b. serve as a relative measure of suspended solids content when correlated with data for turbidity.

   c. assist in determination of a correlation to "bloom" growths.

   d. assist in locating surveillance stations and as an indicator for increased study need.

   e. assist in mapping of flow patterns.

5. Solar intensity (automated monitor available)

   a. provide a better definition of the role of light in triggering and/or sustaining "bloom" growths when correlated with data for chlorophyll and temperature.

I. In-Lake Automated Monitoring cont'd.

D. cont'd.

6. Chlorophyll A + B (automated monitor available)
   - a. provide a relative measure of algal population density.
   - b. provide growth rate and generation time data *in situ*.
   - c. record development of "bloom" growths and intensity and duration of such growths.
   - d. assist in developing relationships of phytoplankton to solar intensity etc.
   - e. may assist in mapping of flow patterns.

7. Apparent turbidity (automated monitor available)
   - a. serve as a relative measure of suspended solids content when correlated with conductivity.
   - b. serve as indicator of sediment transfer and resuspension.
   - c. assist in development of the role of light in the production of "bloom" growths when correlated with solar intensity.
   - d. assist in mapping of flow patterns and areas of turbulence.

E. The following parameters are both physiologically critical to all microbiota and subject to frequent changes. Accordingly, these parameters have been considered for continuous automated monitoring. However, capital investment, size, and maintenance requirements prohibit use of such automated systems at present. It is recommended that as such systems are further developed that they be implemented in the data collection and surveillance program.

I. In-Lake Automated Monitoring cont'd.

E. cont'd.

- a. Carbon dioxide
- b. Ammonia nitrogen
- c. Nitrite nitrogen
- d. Nitrate nitrogen
- e. Alkalinity
- f. Phosphorous

II. Manual Sampling and Examination

A. It is recommended that surveillance stations, in addition to the In-Lake Automated Monitoring, be established throughout Lake Erie and at the points of discharge of all major tributaries to the lake for the purpose of manual sampling and examination of water. Such surveillance stations would serve to:

1. Provide additional water samples, representitive of the entire Lake Erie, for analysis and later development of accurate isopleths for a variety of of significant parameters.

2. Provide data required for development of models for Lake Erie.

3. Indicate areas requiring intensified examination.

4. Permit modifications to the data collection and surveillance systems to ensure acquisition of only beneficial data.

II. Manual Sampling and Examination cont'd.

B. It is recommended that a flow model for the entire Lake Erie be prepared as data permit so that surveillance stations could be located at the most adventageous sites. Location of surveillance stations based upon model findings would eliminate much of the error and effort wasted by estimation of surveillance sites.

C. The following sites are recommended for location of manual stations: [W. B. Plate]

WESTERN BASIN

It is recommended that from fifty (50) to seventy (70) surveillanc stations be located in the Western Basin of Lake Erie along a grid network having intervals, initially, of five miles. Interval and station number would be increased or decreased as data indicat

[C + E.B. Plate]

CENTRAL BASIN

It is recommended that manual sampling be done at fourteen (14) surveillance stations and each of eight (8) automated monitoring sites located in the Central Basin of Lake Erie. Such would provide a total of twenty two surveillance stations (22) for the Central Basin. Location of proposed surveillance stations are:

1.	42°00' N. Lat.	82°25' W. Long.	
2.	41°50' N. Lat.	82°25' W. Long.	(monitor site)
3.	41°43' N. Lat.	82°25' W. Long.	
4.	41°35' N. Lat.	82°25' W. Long.	(monitor site)
5.	41°28' N. Lat.	82°25' W. Long.	
6.	42°15' N. Lat.	81°40' W. Long.	
7.	42°05' N. Lat.	81°40' W. Long.	(monitor site)
8.	41°55' N. Lat.	81°40' W. Long.	
9.	41°45' N. Lat.	81°40' W. Long.	(monitor site)
10.	41°35' N. Lat.	81°40' W. Long.	
11.	42°30' N. Lat.	81°15' W. Long.	
12.	42°30' N. Lat.	81°00' W. Long.	
13.	42°20' N. Lat.	81°00' W. Long.	(monitor site)
14.	42°13' N. Lat.	81°00' W. Long.	
15.	42°05' N. Lat.	81°00' W. Long.	(monitor site)
16.	41°56' N. Lat.	81°00' W. Long.	
17.	42°06' N. Lat.	80°22' W. Long.	
18.	42°30' N. Lat.	80°15' W. Long.	
19.	42°25' N. Lat.	80°10' W. Long.	(monitor site)
20.	42°23' N. Lat.	80°05' W. Long.	
21.	42°18' N. Lat.	80°00' W. Long.	(monitor site)
22.	42°15' N. Lat.	79°57' W. Long.	

II. Manual Sampling and Examination cont'd.

C. cont'd.

CENTRAL BASIN cont'd.

Surveillance stations have been positioned in the aforementioned locations so as to permit examination of flows communicating between the Western Basin and Central Basin and between the Central Basin and Eastern Basin. Such positioning also should permit examination of Central Basin waters streaming adjacent to the South shore.

EASTERN BASIN

It is recommended that manual sampling be done at three (3) surveillance stations and at each of five (5) automated monitor sites located in the Eastern Basin of Lake Erie. Such would provide a total of eight (8) surveillance stations for the Eastern Basin. Location of proposed surveillance stations are:

1.	42°38' N. Lat.	80°05' W. Long.	
2.	42°35' N. Lat.	79°55' W. Long.	(monitor site)
3.	42°34' N. Lat.	79°40' W. Long.	
4.	42°30' N. Lat.	79°30' W. Long.	(monitor site)
5.	42°48' N. Lat.	79°35' W. Long.	
6.	42°46' N. Lat.	79°15' W. Long.	(monitor site)
7.	42°38' N. Lat.	79°10' W. Long.	(monitor site)
8.	42°46' N. Lat.	79°00' W. Long.	(monitor site)

Surveillance stations have been positioned in the aforementioned locations so as to permit examination of flows communicating between the Central and Eastern Basins of Lake Erie and flows discharged to the Eastern Basin from the Grand, Buffalo, and Cattaraugus tributary streams. Such positioning also permits evaluation of waters exiting the Eastern Basin of Lake Erie via the Niagara River.

II. Manual Sampling and Examination cont'd.

D. The following program for manual sampling at surveillance stations is recommended until such time as data indicate otherwise:

1. Bidaily, at each of the proposed 80 - 100 surveillance stations (maximum of three samplings per station per seven day week), at a depth representitive of surface water.

2. Weekly, at one-half (40 - 50) of the proposed surveillance stations, at a depth representitive of mid-depth and bottom waters.

ONE WEEK INTERVAL

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
STATIONS VISITED	80 min. 100 max.	40 min. 50 max.	80 min. 100 max.	0 0	80 min. 100 max.	0 0	0 0
NO. SAMPLES	80 min. 100 max.	80 min. 100 max.	80 min. 100 max.	0 0	80 min. 100 max.	0 0	0 0

E. It is recommended that manual sampling at surveillance stations be conducted from helicopter as well as transportation of all collected water specimens. Such a practice is considered necessary as:

1. Sampling must be frequent and concurrent at surveillance stations for development of accurate isopleths which represent the Lake Erie system as a whole. Such frequent and concurrent sampling cannot be achieved by surface craft.

2. Delay in sampling and examination must be minimized in order to reduce the effects of change in the Lake Erie environmental system and maintain the integrity of developed data.

3. Adequate number of surface craft are not available to meet the demands of the surveillance program. Further, such craft are limited due to factors of speed, navigability, cost, maintenance etc.

II. Manual Sampling and Examination cont'd.

F. It is recommended that the following parameters be determined on all water samples collected at the surveillance stations:

1. To be determined at the time of sample collection:
    a. Air temperature - water temperature
    b. Wind direction and velocity
    c. Water surface characteristics
    d. Solar intensity
    e. Barometric pressure
    f. Dissolved oxygen
    g. Turbidity
    h. Conductivity
    i. Chlorophyll A + B
    j. pH

    The above parameters can be analyzed, or observed, immediately upon collection of water samples. Use of compact and highly accurate instrumentation allows for such analyses. Limited analysis of water samples at the time of collection also reduces the burden placed on the base laboratory staff.

2. To be determined at the base laboratory:
    a. Phosphorous series
    b. Nitrogen series
    c. Total organic carbon (in lieu of BOD and COD
    d. Total solids
    e. Suspended and/or dissolved solids
    f. Chloride
    g. Sulfate
    h. Fluoride
    i. Silica
    j. Hardness (total)
    k. Buffer capacity (potentiometric titration of alkalinity)
    l. Sodium
    m. Potassium
    n. Plankton (total and differential counts)
    o. Carbon dioxide

II. Manual Sampling and Examination cont'd.

G. It is recommended that samples collected for determination of phosphorous content be refrigerated at temperatures above the freezing point and further, that no chemical additives be used for the purpose of preservation as such have been shown to alter phosphorous equalibrium.

H. It is also recommended that portions of all water samples collected be centrifuged and filtered through membranes having an average porosity no greater than 0.8 microns and following this, be cataloged and stored in a surveillance "bank". Provision of such a surveillance "bank" would allow the investigator to look back in time to determine constituents present in samples taken which at the time were not on his list of required analyses.

I. It is recommended that periodic examination of stored samples from the surveillance "bank" be conducted to determine trace constituents. Such is considered necessary as present data for Lake Erie do not adequately define the role of trace elements as sources of micronutrients for phytoplankton. The movement of such trace elements from one area of the lake to another has not, at present, been adequately defined. The following trace elements are suggested for periodic (i.e., monthly) examination:

1. Zinc
2. Cadmium
3. Arsenic
4. Boron
5. Iron
6. Molybdate
7. Manganese
8. Aluminum
9. Berylium
10. Copper
11. Silver
12. Nickel
13. Cobalt
14. Lead
15. Chromium
16. Vanadium
17. Barium
18. Strontium

III. Additional Data Acquisition

In addition to the sub-programs of In-Lake Automated Monitoring and Manual Sampling and Examination, it is recommended that supplemental systems be incorporated into the Data Collection and Surveillance Program. Such would serve to acquire data of a detailed and corroborative nature.

THE SURVEILLANCE VESSEL

A. It is recommended that a surface vessel, equipped with laboratory and technical staff, be provided for the purpose of further off-shore surveillance. Such a vessel would also permit:

1. Extended, in-depth study of physical, chemical, and biological parameters at areas for which automated monitoring systems are not available.
2. Analyses, in vivo and in situ, of parameters not able to be automatically monitored.
3. Flexibility in sampling and examination practices.
4. Assistance in maintenance of automated monitoring systems and retrieval of automatically monitored data.

B. Two problems requiring study beyond the scope of routine sampling and examination have been considered as possible assignments for the surveillance vessel staff. They are:

1. Define the nutritional status of phytoplankton in Lake Erie and at points of discharge of major tributaries.
2. Define the rate and ecological effects of sediment deposition in Lake Erie and at points of discharge of major tributaries with special emphasis on the problem as it exists in the Western Basin.

III. Additional Data Acquisition cont'd.

THE SURVEILLANCE VESSEL cont'd.

With regard to the nutritional status of phytoplankton, it is suggested that consideration be given to the application of the following bioassay techniques:

1. Nitrogen uptake rate by NH_4-N absorption.
2. Nitrogen fixation rate
3. Orthophosphate extraction for determination of limiting or surplus phosphorous content.
4. Alkaline phosphatase activity as a measure of surplus phosphorous content.

Such techniques may assist in determination of which nutrients (inorganic) are required for growth of phytoplankton and further, which nutrients can be stored in excess of their immediate requirements. The bioassay techniques suggested for possible application in this program have been developed and practiced in both laboratory and field studies with success.

With regard to defining the rate of sediment deposition in Lake Erie and at the points of discharge of major tributaries, the following approaches are suggested for consideration:

1. Insertion of weighted cylinders for collection of sediment at all surveillance stations with retrieval at three month intervals.
2. Insertion of weighted cylinders for collection of sediment at all surveillance stations with retrieval of cylinders and adjacent bottom deposits at three month intervals. Collection of bottom deposits adjacent to the cylinders would provide a gross appraisal of cylinder data integrity and significance.
3. Insertion of weighted cylinders for collection of sediment at fewer, selected surveillance stations with retrieval of cylinders at weekly intervals. As sediment collected in cylinders is not subject to natural forces causing scour of the lake bottom and resuspension of deposits, there is an inherent error in the cylinder technique which can be reduced significantly by more frequent retrievals.

III. Additional Data Acquisition cont'd.

THE SURVEILLANCE VESSEL cont'd.

All approaches are thought to permit quantitative appraisal of sediment deposition rate. In selection of the actual approach, consideration must be given to:

1. The inherent error involved in sediment collection techniques.
2. The time and effort required for completion of such studies.
3. The number of stations and sampling frequency required for development of factual, quantitative data.

Samples of bottom deposits should be subjected to examination in a manner which is consistent with previous studies. It is recommended that portions of all bottom deposit samples be dried, sterilized, cataloged, and stored for future reference in the surveillance "bank".

WATER INTAKE SURVEILLANCE SYSTEM

Perhaps one of the simplest, yet highly effective method of acquiring water quality data for Lake Erie could be realized by enlisting the assistance of water treatment facilities which are located along the perimeter of Lake Erie. This assistance could be in the form of (1) provision of water samples from the intake, (2) chemical and biological analyses of water samples from the intake, or (3) both. (A cooperative program involving the F.W.P.C.A., State of Ohio Department of Health, and seventeen water treatment plants on the Ohio shores of Lake Erie now exists.)

It is estimated that approximately forty to fifty major water intakes exist on the perimeter of Lake Erie. As intakes for water treatment plants are generally not located beyond a mile into the lake, waters received from such intakes can be regarded as being shore waters. The proposed Data Collection and Surveillance Program does not provide for intensive examination of shore waters in the Central and Eastern Basins of Lake Erie. Supplemental information realized through the assistance of these water treatment facilities could prove to be invaluable in maintaining data integrity throughout the entire lake.

Therefore, it is recommended that wherever such water intake surveillance systems have not been established, that such be implemented and incorporated into the Data Collection and Surveillance Program should it be adopted.

III. Additional Data Acquisition cont'd.

TRIBUTARY STREAM SURVEILLANCE SYSTEM

It is recommended that surveillance systems be designed to characterize wastewater and land runoff loadings to streams tributary to Lake Erie and further, that data generated from such surveillance systems be made available to the proposed Data Collection and Surveillance Program staff. Such data are required if flow pattern and sediment deposition studies are to be effective.

DATA COLLECTION AND SURVEILLANCE PROGRAM COST BREAKDOWN

FIELD OPERATIONS:

In-Lake Automated Monitoring Program:

35 monitors @ $20,000.00 each (FWPCA Estimate) =	$ 700,000.00
Cost of helicopter rental =	455,000.00
Salaries for 8 sample handlers =	29,120.00
SUBTOTAL:	1,184,121.00

LABORATORY OPERATIONS:

Chemistry & Biology:	
Salaries for 19 chemist-biologists =	$ 171,000.00
Data Processing:	
Salaries for 5 data handlers (FWPCA Estimate) =	28,500.00
Administrative:	
Salary for Project Director (FWPCA Estimate) =	15,000.00
Salary for Lab Director (FWPCA Estimate) =	15,000.00
Salary for Data Supervisor (FWPCA Estimate) =	10,000.00
SUBTOTAL:	$ 239,500.00

EQUIPMENT: (FWPCA Estimate)

SUBTOTAL:	$ 160,000.00

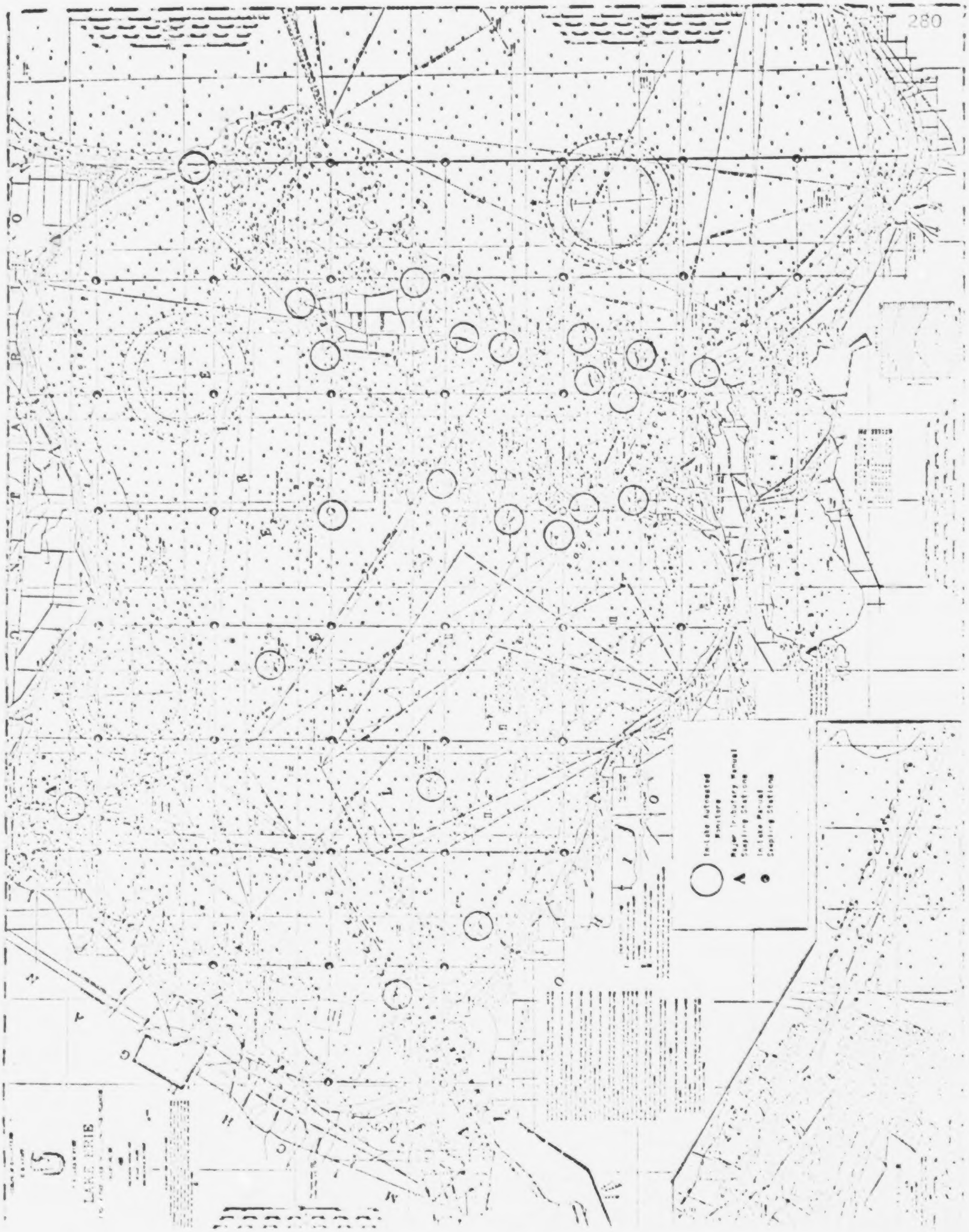
SUPPLIES: (FWPCA Estimate)

SUBTOTAL:	$ 10,000.00

MISCELLANEOUS: (FWPCA Estimate)

Utilities =	$ 1,000.00
Rental of laboratory space @ $4.00/ft^2 x 100,000 ft^2 =	400,000.00
SUBTOTAL:	$ 401,000.00

GRAND TOTAL 1ST YEAR $1,994,620.00


LAKE ERIE
In-Lake Automated Monitors
Major Tributary Manual Sampling Stations
In-Lake Manual Sampling Stations

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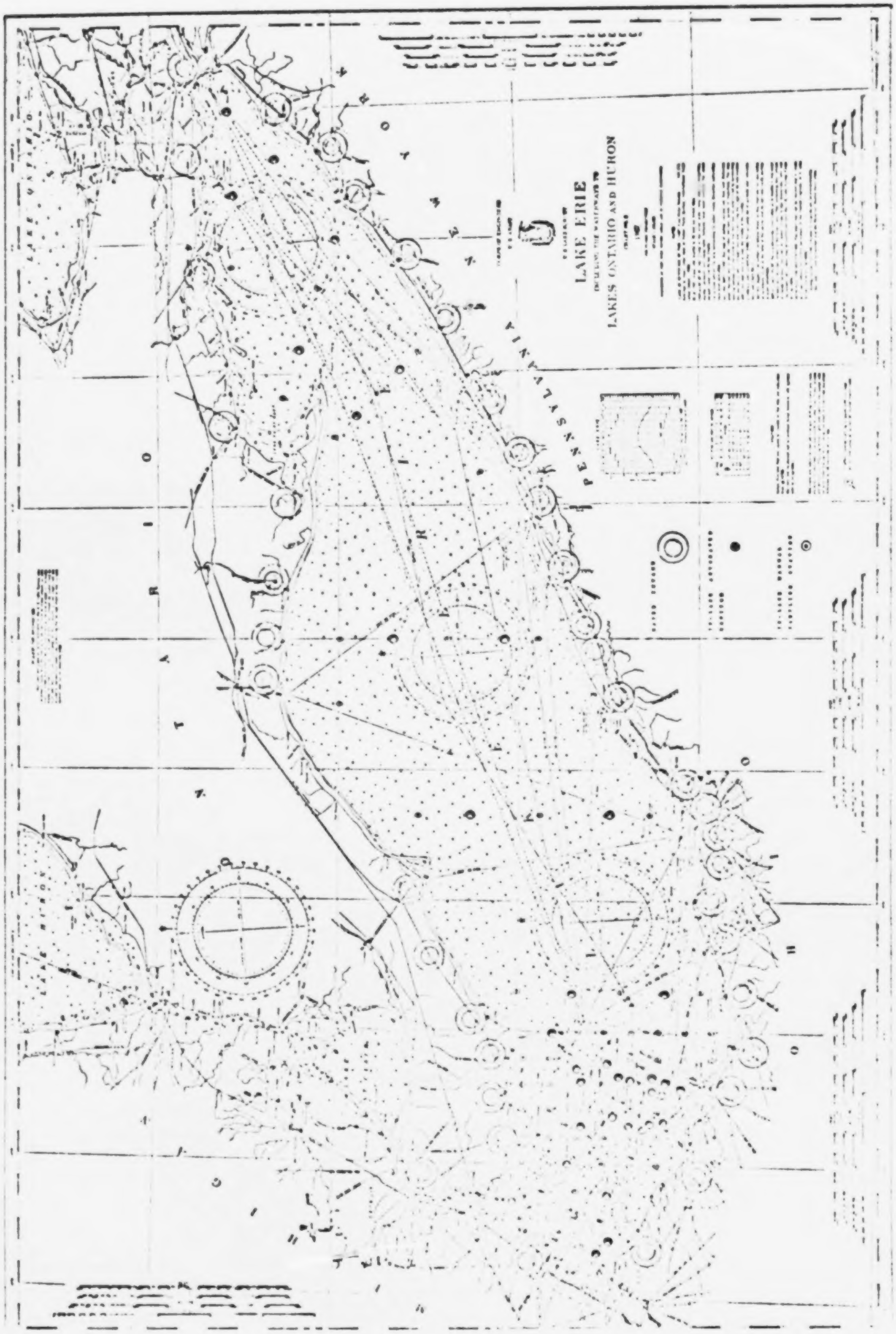
LAKE ERIE
LAKES ONTARIO AND HURON
PENNSYLVANIA
ONTARIO

MR. STEIN: Are there any comments or questions?

MR. LYON: Mr. Chairman, I think this report makes a very important point. It says that the people who will be going to spend money on cleaning up Lake Erie pollution are entitled to know what is happening to the lake as a result, and I think this is important.

But I think the report seems to ignore the fact that we already have large masses of data that the Department of Interior has spent several million dollars collecting -- past data -- and are continuing to collect data. The Canadian Ministry of Energy, Mines and Resources has a large data collection system. The Ontario Water Resources Commission -- for example, the report says we need 50 to 70 stations in the Western Basin. The Ontario Water Resources Commission alone has some 50 stations in the Western Basin.

Certainly we need to collect more data, but I think any monitoring program we have should carefully consider what is now going on, so we don't collect data that already have been collected by somebody else. We certainly need to collect data, but let's not collect unnecessary data.

MR. STEIN: Any comments or questions?

MR. EAGLE: Yes. May I respond to that?

MR. STEIN: Yes.

MR. EAGLE: I would submit that this committee very carefully investigated all of this: the various sources of information, the type of detailed information, and so on, that they are talking about is not available, is not currently being obtained. I would just like to apologize to the conferees if we have bored you in any way with this detailed proposed scientific analysis or diagnosis of the so-called illness of Lake Erie. We think that is extremely important, and I can assure you that this information in this detail is not available, and is not currently being obtained, and if you can show us where it is, Mr. Lyon, I would very much appreciate having it.

MR. LYON: All I would suggest, Mr. Eagle, is that if we have a report of this type that it ought to include a description of what the other data collection agencies -- and there are many of them -- what they are doing. This report does not include that. My suggestion would be that we -- and we do need to take a comprehensive look at what data should on a continuing basis be collected, but we ought to consider all of the other agencies that are collecting it and if they did in fact study all of these things, as you suggest, and let's put it in the report. It is not in the report.

MR. EAGLE: Well, we didn't want to drag it out for another couple of hours, you know.

You have already objected to this. You objected even before you heard the report. This is what amazes me.

MR. STEIN: No one objected. I raised the question as chairman. You know, as chairman, I raise questions to get a consensus of the conferees.

I think it is fair to say here that we do have very important information. The reason I raised the question -- and I responded to several inquiries made to me by several of the conferees as they were going through this -- this is a very detailed proposal. Probably and undoubtedly I think this should be considered very carefully by the conferees and probably by their technical staffs.

The question that we have here, George, is just a question of if we are going to go ahead with a program of this magnitude as a salesmanship operation to get this thing going and considered. The question is whether we go through all of the details of the report now, when they first have seen this, or with such detailed comments where we have metes and bounds of where sampling stations should be, or precisely whether we get alkalinity or phosphate, etc. I would think that all of the conferees would probably want to have their technical staffs examine this in some detail before they make a commitment.

Wouldn't you, on this?

MR. EAGLE: Certainly.

MR. STEIN: Right.

MR. EAGLE: And I wish you would have given us the benefit of the doubt and let us proceed.

MR. STEIN: We sure are. It is impressive.

What I am saying -- I am not arguing against what is in the report at all.

MR. EAGLE: You didn't want me to stand here and read you all of the metes and bounds, did you?

MR. STEIN: How about Page 5? I don't know what you mean by metes and bounds. It says here is where locations of the stations should be: 41 degrees, 50 minutes north latitude, 82 degrees, 25 minutes west longitude. I don't know.

And, by the way, I am just reading one of a series of eight.

By the way, this may be perfectly accurate, and this may be the best place to put the report, but I think with first blush that I would suspect that the Conferees would want to go over that kind of detail pretty carefully before they commit themselves.

MR. EAGLE: I appreciate that.

MR. STEIN: Right. Thank you.

Are there any other comments or questions?

Mrs. June Brown

MR. EAGLE: May I proceed, Mr. Chairman?

MR. STEIN: Yes.

MR. EAGLE: I have three people who would like to make brief statements. Mrs. June Brown is representing the League of Women Voters, and she is from Toledo, Ohio.

Mrs. Brown.

STATEMENT OF MRS. JUNE M. BROWN, LEAGUE OF WOMEN VOTERS, TOLEDO, OHIO

MRS. BROWN: Thank you, Mr. Eagle.

Mr. Chairman, Conferees, ladies and gentlemen, I am June M. Brown, Environmental Resources Chairman of the League of Women Voters of Toledo-Lucas County, representing the Lake Erie Basin Committee of the League of Women Voters. Our Basin Committee, representing more than seventy Leagues in the States of New York, Ohio, Indiana, Pennsylvania and Michigan, has published a book, "Lake Erie, Requiem or Reprieve?" We have testified at the Lake Erie Enforcement Conference and support the implementation of the recommendations.

We are pleased that the Secretary of the Interior, Walter J. Hickel, has convened this Progress Evaluation Meeting to review the Federal-State pollution abatement program for Lake Erie. We wish to impart to the Conferees our interest and concern regarding today's discussion.

Our members across the Nation have been studying water resources at all levels of government for over twelve years. The League's interest is in conserving and enhancing our water resources to ensure maximum use for all purposes by all citizens now and in the future.

We have become increasingly involved in the problems of water pollution, sewer and sewage treatment plant funding, dumping and dredging regulations, thermal effect, water quality standards, interbasin diversion, gas and oil well drilling, radioactive wastes, pesticides, eutrophication, and land use.

Our studies have shown that almost nothing is known about the possible long-range effects in some of these areas. Technical data with respect to nutrient algal relationships are limited.

The Conferees must firmly establish the economic feasibility and benefit of phosphate and nitrogen removal treatment. Questions must be answered by meaningful data and not opinion expressing the belief that doing something should reduce phosphorus and thus reduce the algae.

The goal of the Conferees should be a joint Federal-State development to appraise influences on water quality and controls which can effectively achieve desired objectives.

We wish to express our interest in a Data Collection and Surveillance Program for Water Quality Management in Lake Erie which would not be just a crash program or be subject to limited funding. Detailed and continuous monitoring may be needed in areas where blooms do and do not occur to determine whether a triggering agent can be defined. Weather, temperature, quality of water, flow patterns, currents, wind and physical conditions all relate to algal growth. Data for these parameters must also be established before feasible corrective procedures can be suggested or implemented. The need for the creation of predictive models is certainly indicated. Such would provide valuable tools for both surveillance and water management efforts.

As we gather our forces for the final stages of the thrust toward pollution control, we should pause to evaluate our past performance in order to comprehend the need for change and give direction to our goals.

Thank you for the opportunity to present our views.

MR. STEIN: Thank you.

Are there any comments or questions?

If not, thank you very much.

MRS. BROWN: Thank you.

MR. STEIN: Mr. Eagle.

MR. EAGLE: Our next participant is Mrs. James H. Angel, who is the Chairman of the Citizens for Land and Water Use Committee, Cleveland Metropolitan Area.

Mrs. Angel.

STATEMENT OF MRS. JAMES H. ANGEL,
CHAIRMAN, CITIZENS FOR LAND AND
WATER USE, CLEVELAND, OHIO

MRS. ANGEL: Thank you, Mr. Eagle, and Mr. Stein, Conferees, and ladies and gentlemen.

I would first like to read a quote from David O. Dominick, Commissioner of the Federal Water Pollution Control Administration. He advises people like myself that we must keep after the government to do the job: Goad us, harry us, stay on our backs. Do this, and, believe me, we will get the job done.

Now, as far as the removal of the phosphates from Lake Erie, on the twenty-third of January, 1968, I attended a chemical engineers' meeting, and I learned that if you remove the phosphates, as has been suggested at this meeting, it is very possible that we may create a monster algae that we do not know how to cope with.

Mrs. James H. Angel

Also, the Cladophora -- if I am saying that right -- algae that is giving us the most trouble for taste and odor, by removal of the phosphates, this will not remove this particular troublesome algae.

Since Secretary of the Interior Walter J. Hickel asked for this meeting, we want his office to know that we are very concerned about thermal pollution and possible radioactivity from the proposed nuclear electric power-plants along the lake.

Another thing: We attend these meetings every week, it seems, and we repeat ourselves, and I know that from the June fourth meeting, that Mr. Stein is not aware of how much we know as lay people.

Engineers design pollution control devices that will remove 80 percent to 95 percent of deleterious material. The truth is that these devices seldom operate according to engineers' design. Add to this human error or stupidity, as when the supernatant of the Lakewood sewage treatment plant was discharged into Rocky River instead of being returned to the head of the plant on May 15, 1969, at about 7:30 p.m.

Now, rather than spend our money and your time removing phosphates, why don't we see that the Federal Government and the State Government and the municipalities

-- why don't we see that the sewage gets to the sewage treatment plant, and for Pete's sake, clean it up.

Thank you. (Applause)

MR. STEIN: I take it there are no comments.

MR. EAGLE: One more request, sir.

This is Mr. Charles Marquette, who is the Water Pollution Chairman of the Forest City Civic Association here in the Cleveland area.

Mr. Marquette.

STATEMENT OF CHARLES MARQUETTE, WATER POLLUTION CHAIRMAN, FOREST CITY CIVIC ASSOCIATION, CLEVELAND, OHIO

MR. MARQUETTE: My name is Charles Marquette. I am the head of the Air and Water Pollution Committee, Chairman of the Forest City Civic Association.

One doctor said here in this building here about a month or two ago -- he said, "The lake ain't dead."

In the first place, the water tastes dead and the water smells dead, and he didn't like that very good either.

Now, this is a toxic or polluted liquid, as I hear, pumped into the ground around Painesville, and will it seep out of the ground? I would like to know why the plants have to let their polluted water out in the river, lake, or sewers before the solids and lubricants settle in a tank or water lagoon of some kind.

We can't take care of our own air and water pollution now. Why go all over the world for new plants and build new homes when we can't take care of our own sewers and water now?

MR. EAGLE: Thank you very much.

MR. STEIN: Thank you, sir.

Any comments or questions?

If not, thank you very much.

Mr. Eagle.

MR. EAGLE: This concludes our presentation. Thank you very much for your patience.

(The remainder of Mr. Eagle's report follows.)

WATER POLLUTION CONTROL BOARD
DEPARTMENT OF HEALTH
COLUMBUS, OHIO

WATER QUALITY STANDARDS ADOPTED BY THE BOARD APRIL 8, 1969, FOR THE ROCKY, CUYAHOGA, CHAGRIN AND GRAND RIVER BASINS

The Ohio Water Pollution Control Board hereby adopts water quality standards for the waters of the following river basins:

1. The Rocky River
2. The Cuyahoga River
3. The Chagrin River
4. The Grand River

The minimum conditions applicable to all waters adopted by the Board on October 10, 1967, shall apply to all waters under consideration herein and the water quality for various uses adopted on October 10, 1967, are applicable as indicated herein. The following criteria for additional uses are hereby adopted:

Cold Water Fisheries
Minimum dissolved oxygen concentration - 6.0 mg/l
Maximum water temperature - 70 deg. F.
pH -- not less than 6.5 nor greater than 8.5 at any time;

Partial Body Contact Recreation
Bacteria: Coliform group not to exceed 5,000 per 100 ml as a monthly average value (either MPN or MF Count) nor exceed this number in more than 20 percent of the samples examined during any month; nor exceed 20,000 per 100 ml in more than five percent of such sample.

The criteria for various uses shall apply as follows:

Rocky River Basin

1. Rocky River and all tributaries:
    a. Partial Body Contact Recreation
    b. Aquatic Life "A"
    c. Industrial Water Supply.
2. In addition, the West Branch upstream of U.S. Route 3, the North Branch of the West Branch downstream of Bagdad Road, the East Branch in the vicinity of Baldwin Lake and Baldwin Creek in the vicinity of Coe Reservoir:
    a. Public Water Supply.

3. Wallace Lake, Hinckley Lake, the East Branch immediately downstream of Hinckley Dam and in the vicinity of Albion Park, Sleepy Hollow and Brunswick Lakes on Plum Creek, and other small lakes currently used for swimming or water contact sports:

    a. Full Body Contact Recreation.

Cuyahoga River Basin

1. Cuyahoga River upstream of Lake Rockwell Dam and tributaries thereto:

    a. All uses.

2. Cuyahoga River from Lake Rockwell Dam to State Route 17:

    a. Partial Body Contact Recreation

    b. Aquatic Life "A"

        Upstream of Akron Wastewater Treatment Plant by not later than January 1, 1972.

        Downstream of the Akron Wastewater Treatment Plant by not later than January 1, 1975; Aquatic Life "B" by not later than January 1, 1972.

    c. Industrial Water Supply.

3. Cuyahoga River from State Route 17 to Coast Guard Station:

    a. Industrial Water Supply
    b. Aquatic Life "B' by not later than January 1, 1975.

4. Little Cuyahoga River upstream of State Route 91 and downstream of Hazel Street:

    a. Partial Body Contact
    b. Aquatic Life "A"
    c. Industrial Water Supply.

5. Little Cuyahoga River between State Route 91 and Hazel Street, Summit Lake and the Ohio Canal:

    a. Aquatic Life "B'
    b. Industrial Water Supply.

6. All other tributaries between Lake Rockwell Dam and Harvard Avenue:

    a. Partial Body Contact
    b. Aquatic Life "A"
    c. Industrial Water Supply.

7. For the following lakes, ponds, or reservoirs: Aquilla, Brady, Congress, Geauga, Hudson Springs, Mogadore, Muddy (Hodson), Muzzy, Punderson, Sandy, Snow, Springfield, Silver, Wyoga, and Aurora Pond as well as such other small lakes currently used for swimming and water contact sports:

   a. Full Body Contact Recreation
   b. Aquatic Life "A"
   c. Industrial Water Supply.

8. In addition, Muddy (Hodson), Muzzy, and Sandy Lakes:

   a. Public Water Supply.

Chagrin River Basin

1. Chagrin River and all tributaries:

   a. Partial Body Contact
   b. Aquatic Life "A"
   c. Industrial Water Supply.

2. In addition the East Branch at its mouth and the main stem in the vicinity of Daniels Park:

   a. Public Water Supply.

3. In addition the main stem of the Chagrin River upstream of Chagrin Falls, and the Aurora and the East Branches:

   a. Cold Water Fisheries.

4. Bass, Paw Paw, Tanglewood, Round-up, Kenston Lakes, and Lake Louise, Lake Lucerne and Lake Taylor as well as such other small lakes currently used for swimming and water contact sports:

   a. Full Body Contact Recreation.

Grand River Basin

1. The Grand River (upstream of U.S. Route No. 20) and all tributaries:

   a. Cold Water Fisheries
   b. Full Body Contact Recreation
   c. Public Water Supply.

2. The Grand River downstream of U.S. Route No. 20:

   a. Aquatic Life "B" by not later than January 1, 1971, and
   b. Aquatic Life "A" by not later than January 1, 1975.

Implementation and Enforcement Plan

The Ohio Water Pollution Control Board, under the provisions of Sections 6111.01 to 6111.03, 6111.31 to 6111.38, and 6111.99, Ohio Revised Code, has authority to control, prevent, and abate pollution in the waters of the state. In accordance with such authority, the Board hereby adopts the following program and requirements for the prevention, control, and abatement of new or existing pollution of the waters of the state considered herein:

1. The design or critical stream flow will be used in applying stream water quality criteria. For free flowing streams unaffected by significant diversions or regulations, this flow will be the annual minimum seven consecutive day warm weather flow which is exceeded in 90 percent of the years. Where low stream flows are affected by regulations or diversion, adjustments to the historical records will be made for these effects;

2. All plans and proposals for abatement or correction of pollution will be approved by the Ohio Department of Health as required by law and such approvals shall constitute approval by the Board;

3. All sewage and organic industrial wastes will be given not less than secondary treatment (biochemical oxidation), and the facilities to provide such treatment will be constructed and placed in operation without delay, and in no instance later than the dates specified in the approved schedules;

4. All effluents will be continuously and satisfactorily disinfected, prior to discharge, to meet the criteria for downstream water uses; and the facilities to provide such treatment will be placed in operation without delay;

5. All inorganic industrial wastes and other pollution constituents will be adequately treated and/or controlled to meet the water quality conditions and criteria, and the facilities to provide such treatment will be constructed and placed in operation without delay and in no instance later than the dates indicated in the approved schedules;

6. Local programs will be initiated to control and reduce pollution resulting from (a) bypassing, (b) spillages, and (c) discharges resulting from construction or breakdowns;

7. Necessary studies will be made and, where feasible, plans and construction programs will be developed as rapidly as possible for reducing pollution from existing combined sewer overflows and inadequate sewage collection systems;

8. Where necessary, to improve water quality and to reduce algal growths, supplementary treatment of wastewaters will be provided to the fullest extent consistent with current research and technological advances;

9. A comprehensive program for further improvement of the water quality of the Cuyahoga River downstream from Akron by such means as low flow augmentation by at least 100 to 150 cfs, by in-stream aerations, particularly in the navigation channel, or a combination of these and/or other appropriate means, is hereby made a part of this plan;

10. A comprehensive plan for sewerage and sewage treatment for the rapidly growing areas of Cuyahoga, and Summit Counties which provides for the elimination of discharges to the smaller tributary streams is urgently needed. The Board recognizes that the implementation of such a plan will be necessary to fully meet the water quality conditions and criteria and encourages prompt actions in this regard;

11. That portion of master plan for sewerage of City of Cleveland calling for the interception of certain urban and industrial drainage streams for treatment is hereby made a part of this plan; and

12. The stream-water quality monitoring program will be expanded to adequately provide assurances of compliance with these standards.

Furthermore, the Board and the Ohio Department of Health will encourage and assist other agencies such as the Ohio Departments of Natural Resources, Agriculture and Highways and the Soil Conservation Service, U.S. Department of Agriculture, in the implementation of effective soil erosion control programs, and programs for the reduction of the run-off of phosphorous, nitrogen compounds, and pesticides.

Enforcement of these requirements will be carried out by means of the respective permits issued to municipalities, counties, industries, and other entities discharging to the waters considered herein, and the failure to comply with the permit conditions will result in legal action in accordance with the provisions of the law.

SCHEDULES OF CORRECTIVE MEASURES

(Including secondary treatment and disinfection)

1. ROCKY RIVER BASIN

		Completion Dates		
		Report & Gen.Plan	Detail Plans	Constr.
(1) Municipalities				
~~Broadview Hts.~~	~~Addtnl sewers & new treat.facils~~		~~8-15-70~~	~~12-15-71~~
Brook Park	Enlarg.of treat.facils.	6-15-70	1-15-71	1-15-72
Lakewood	Reduct.of storm water from sew.syst.	Program underway		12-15-72
Medina	Enlarg.of treat.facils.	1-1-70	1-1-71	9-1-72
Middleburgh Hts.	Addtnl trunk & sewers - trib.to new treat.plt by Cuya.Co.-SD 8.	-	-	12-1-69
North Olmsted	Enlarg.of treat.facils.	Apprvd	1-1-70	12-1-71
*North Royalton	(See Cuyahoga River)			
*Olmsted Falls	New sew.& treat.facils.	-	Apprvd	1-1-71
(2) County Sewer Districts				
Cuyahoga County Middleburgh Hts SD 8	New treat.facils (UC)	-	Apprvd	10-1-69
Lorain Co. SD 60 West View Park Subd.	New treat.facils (UC)	-	Apprvd	8-15-69
Medina Co. SD 5	New sew.& treat.facils.	-	Subm.11/68	1-1-71
Medina Co. SD 9	Chlor.facils.	-	11-15-69	6-1-70
Medina Co. SD 100	Reduction of storm water from sew.syst.	-	1-15-70	1-1-71
(3) Other Entities				
Trailer Mart,Inc.	Connect.to Olmsted Falls sew.syst.	-	-	1-1-71

* - Board Action after Public Hearing.

		Completion Dates		
		Report & Gen.Plan	Detail Plans	Constr.
1. ROCKY RIVER BASIN - contd.				
(4) Industries				
Farm Packt Pickle Company Medina Co. Montville Twp.	IW treat.facils.	-	Apprvd	6-1-69
Modern Tool and Die Company Medina Co. Liverpool Twp.	IW treat.facils.	-	3-14-68	3-1-69
Natl.Aeronautics & Space Adminis. Brook Park	Chromate base corrosion inhibitors to be eliminated.	-	-	7-1-69
2. CUYAHOGA RIVER BASIN				
(1) Municipalities				
Akron	Enlarg.of prim.& second. treat.facils.	-	9-15-69	12-15-70
	Advanced waste treat. facils.	1-15-72	7-15-73	1-1-75
Aurora - Lake Geauga Area	New sew.syst.& treat.	-	Apprvd	12-15-69
Bedford	Enlarg.of treat.plant (secondary).	Apprvd	11-15-69	12-15-71
Bedford Heights	ditto	Apprvd	2-15-69	9-15-70
Brecksville	Addtnl sewers--to be trib. to Cuy.Co.treat.plant. Cont.progr.of storm water elimination.	-	1-15-70	1-15-75
*Broadview Hts.	Sewerage syst.& new wastewater treat.plant.	-	5-1-69	12-1-70
Burton	Cont.progr.for storm water elimin.--Imprvts to exist. treat.facils incl.disinf.	3-15-69	7-15-70	12-15-71
Cleveland - Southerly Area	Expans.of second.treat. facils (UC)	-	4-15-69	1-1-70
	Advanced waste treat. facils.	1-15-72	7-15-73	1-1-75

* - Board Action after Public Hearing.

2 **CUYAHOGA RIVER BASIN** - contd.

(1) **Municipalities** - contd.

		Completion Dates		
		Report & Gen.Plan	Detail Plans	Constr.
Cuyahoga Falls	Connect.of sewers to Mud Brook Interc.	-	-	12-15-69
*Independence	Connect.of new sew.syst. to Cleveland Southerly.	-	6-15-70	12-15-72
Kent	Extens.of exist.sewers. Cont.program of storm water elimination.	-	6-15-69	12-15-70
*Maple Heights	Connect.of sewer to County sew.syst.(Cleve.Southerly)	-	Apprvd	6-15-70
	Imprvd treat.to exist. wastewater treat.facils.	12-15-69	7-15-70	1-1-72
Middlefield	Imprvts - incl.second. treat.facils.	-	Apprvd	7-1-70
Munroe Falls	Addtnl sewers & connect to Mud Brook Interc.	-	-	6-1-69
Northfield	Imprvts to exist.treat. facilities.	-	5-15-69	7-15-70
*North Royalton - Area C.	Addtnl sewers--to connect to Parma sew.syst. - (Cleveland Southerly).	-	5-15-69	9-15-70
*Oakwood	Sewers & connect.to new county treat.plant.	-	5-1-69	12-15-71
Parma	Connect.of new sewers to Cleve.sew.syst.(Southerly).	-	6-15-69	9-15-70
Ravenna	Enlarg.of treat.facils.	3-1-69	3-15-70	1-15-72
Seven Hills	Connect.of sew.to Cleve. sew.syst. (Southerly).	-	12-15-69	7-15-72
*Solon - Central Area	Enlarg.of treat.facils.	-	Apprvd	6-1-70
Valley View	Sew.syst.& connect.to Cleve.sew.syst.(Southerly).	5-15-69	7-15-70	12-15-71

* Board Action after Public Hearing.

2. CUYAHOGA RIVER BASIN - contd.

(2) County Sewer Districts

		Completion Dates		
		Report & Gen.Plan	Detail Plans	Constr.
Cuyahoga County Brecksville SD 13	Enlarg.of treat.facils.	8-15-69	8-15-70	12-15-71
Cuyahoga County Walton Hills SD 20	ditto	9-15-69	9-15-70	12-15-71
Summit County Munroe Falls SD Plant 11	Connect.to Mud Brook Interceptor.	-	-	6-1-69
Summit County Munroe Falls SD Plant 19 Rustic Acres Subd.	ditto	-	-	6-1-69
Summit County Northampton SD Plant 3 Bellridge Subd.	ditto	-	-	6-1-69
Summit County Northeast SD Plant 6 - GMC	New wastewater treat. facilities.	2-1-69	8-15-69	12-15-70
Summit County Northeast SD Plant 15 Northfield-Macedonia	Enlarg.of treat.facils & reduct.of storm water.	6-15-70	5-15-71	12-15-72
Summit County Stow Twp. SD Plant 4	Connect.to Mud Brook Interceptor.	-	-	6-1-69
Summit County Stow Twp. SD Plant 16 Silver Crest Ests.	ditto	-	-	6-1-69

(3) State Park

		Report & Gen.Plan	Detail Plans	Constr.
Punderson State Park Geauga Co.	Imprvts to exist.treat. facilities.	2-15-70	2-15-71	2-15-72

2. CUYAHOGA RIVER BASIN - contd.		Completion Dates		
		Report & Gen.Plan	Detail Plans	Constr.
(4) Other Entities				
Mike Hewko Bramblewood Subd. (Broadview Hts.)	Connect.to munic.sew. syst.& abandon plant.	-	-	12-1-70
Mike Hewko Royalton Hts. Subd. (N.Royalton)	ditto	-	-	9-15-70
Seneca Club Apts. (Broadview Hts.)	ditto	-	-	12-1-70
(5) Industries				
Alloys & Chemicals Corp. Cleveland	New IW treat.facils.	2-1-69	4-1-69	12-31-69
Alside Homes Corporation Summit County Northampton Twp.	Connect.to Mud Brook Interceptor.	-	-	6-1-69
*Astoria Plating Corporation Parma	Connect.for disch.of pretreated wastes to munic.sewers.	-	-	12-31-69
Bedford Gear & Machine Prod.Inc. Walton Hills	Elimin.of oily increment.	-	-	9-1-69
Consolidated Freightways Summit County W.Richfield Twp.	Imprvts to treat.facils.	-	-	11-1-69
Cornwell Quality Tools Company Mogadore	New IW treat.facils.	-	12-1-69	7-1-70
Cuyahoga Meat Co. Cleveland	New IW treat.facils.	-	Apprvd	4-1-69
Diamond Crystal Salt Company Akron	Complete program to reduce chlorides.	-	-	6-1-69
Firestone Tire & Rubber Company Akron	Addtnl treat.facils or disch.of pretreated wastes to Akron sew.syst.	-	12-31-69	12-31-70

* - Board Action after Public Hearing.

2. CUYAHOGA RIVER BASIN - contd.

(5) Industries - contd.

		Completion Dates		
		Report & Gen.Plan	Detail Plans	Constr.
Ford Motor Co. Engine Plts 1 & 2 Brook Park	Complete IW treat.facils-- Connect to munic.sew.syst.	-	Apprvd	12-31-71
B.F.Goodrich Co. Akron	Addtnl treat.facils or disch.of pretreated wastes to Akron sew.syst.	10-1-69	12-31-69	12-31-70
Goodyear Aerospace Corp. Akron	Pretreat.with disch.to Akron sew.syst.	-	Apprvd	12-31-69
Goodyear Tire & Rubber Company Akron	IW treat.facils for remvl of oil & solids.	-	Apprvd	7-1-69
	Addtnl treat.facils or disch.of pretreated wastes to Akron sew.syst.	-	12-31-69	12-31-70
Harshaw Chemical Company Cleveland	Addtnl reduct.of nickel & fluorides & reduct.of susp.solids.	-	-	12-31-69
Hydraulic Press Brick Company Independence	IW treat.facils.	-	5-1-69	12-31-69
Jones & Laughlin Steel Corp. Cleveland	Acid Iron: Evaluat.of effect of rinse waters.	-	-	12-31-69
	Blast Furn.: IW treat. facils.-solids (UC).	-	Apprvd	12-31-69
	Mill Scale: IW treat. facils.-oil & solids (UC).	-	Apprvd	12-31-69
Lerkis Asphalt Company Akron	Addtnl IW treat.facils.	-	11-1-68	5-1-69
M & M Sand and Gravel Company Akron	ditto	-	4-1-69	6-1-69
Master Anodizers and Platers,Inc. Walton Hills	ditto	-	5-1-69	12-31-69

2. CUYAHOGA RIVER BASIN - contd.

(5) Industries - contd.

		Completion Dates		
		Report & Gen.Plan	Detail Plans	Constr.
Middlefield Swiss Cheese Co-op. Middlefield	Elimin.of whey from IW discharge.	-	3-1-69	9-1-69
Modern Tool & Die Company Parma	IW treat.facils - pretreat. & connect.to munic.sew.syst.when made available.	-	4-1-69	12-31-69
Mohawk Rubber Company Akron	IW treat.facils or connect.to mun.sew.syst. after pretreatment.	-	5-1-69	12-31-69
Ohio Edison Co. Gorge Plant Akron	Reduct.of effects of thermal load.	-	1-1-71	1-1-72
Republic Steel Corp., Cleveland				
Bolt & Nut Div.	Acid Iron: Removal of strong acids evaluat. of effects of rinse waters pretreat.of plating wastes with disch.to city sewers.	-	Apprvd	12-31-69
Cleveland Dist.	Acid Iron: Evaluat.of effects of rinse water disch.	-	-	12-31-69
	Blast Furn.: Imprvd solids removal.	-	Apprvd	12-31-69
	Mill Scale: Imprvd oil and solids removal.	-	4-1-69	12-31-69
Sonoco Products Company Munroe Falls	Connect.to Mud Brook Interceptor.	-	-	6-1-69
U.S.Steel Corp. Tubular Opns. Central Furnaces Cleveland	Blast Furn.: Improved solids removal.	-	-	12-31-69
Weather-Tite Div. Pacific Coast Co. Walton Hills	Elimin.of storm water from wastewater treat. facilities.	-	6-1-69	12-31-69

		Completion Dates		
3. CHAGRIN RIVER BASIN		Report & Gen.Plan	Detail Plans	Constr.
(1) Municipalities				
Aurora - Plant 1	New treat.facils to replace exist.plant.	-	Apprvd	12-15-69
Chagrin Falls	Sew.& plant imprvts - some county area to be made tributary.	9-15-69	9-15-70	12-15-71
Eastlake	Addtnl sewers--trib.to Willoughby-Eastlake plt.	-	Apprvd	7-1-70
(2) Sewer District				
Geauga County Bainbridge Twp. SD 3	Connect.to Chagrin Falls sewer system.	-	-	9-15-70
(3) Industries				
Chase Bag Co. Chagrin Falls	Addtnl reduct.of solids & BOD being disch.to river.	-	12-31-69	12-31-70
Custom Beverage Packers, Inc. Aurora	Addtnl BOD reduction.	-	-	12-31-69

4. GRAND RIVER BASIN

		Completion Dates		
		Report & Gen.Plan	Detail Plans	Constr.
(1) Municipalities				
Chardon	Imprvts to exist.treat. facils.	6-15-69	7-1-70	12-1-71
Fairport Harbor	Second.treat.facils or connect.to Painesville sew.syst.	-	1-15-70	6-15-71
Grand River	Connect.to new county treat.facils.	-	-	12-15-69
Jefferson	Enlarg.of treat.facils & sewer imprvts.	2-15-69	6-15-70	12-15-71
Orwell	New treat.facils.	-	-	12-15-69
Painesville	Imprvts to exist.facils incl.second.treat.	Subm. 11/68	1-15-70	6-15-71
(2) Industries				
Calhio Chemicals, Inc. Lake County Perry Twp.	Imprvts in IW control & disposal.	-	12-1-69	12-1-70
Diamond Shamrock Corporation Fairport	Addtnl solids & chloride reduction, Phase I.	-	12-31-69	12-31-70
	Addtnl chloride reduction, Phase II.	-	-	12-31-74
Glenn Sand & Gravel, Inc. Lake County Concord Twp.	Addtnl treat.facils.	-	-	5-1-69
Glyco Chemicals, Incorporated Lake County Painesville Twp.	New IW treat.facils.	-	3-1-69	6-1-69
UNIROYAL, Inc. Plant Area 1 Lake County Painesville Twp.	ditto	-	8-1-69	6-1-70
UNIROYAL, Inc. Plant Area 4 Lake County Painesville Twp.	ditto	-	8-1-69	6-1-70

APPENDIX II

Table 1 - Status of Municipal Waste Treatment Facilities Ohio Portion of Lake Erie Basin

Table 2 - Status of Industrial Waste Treatment or Reduction Facilities Ohio Portion of Lake Erie Basin

Table 3 - Program for the Removal of Phosphates from Municipal Wastes Discharges Lake Erie Basin

TABLE 1. STATUS OF MUNICIPAL WASTES TREATMENT FACILITIES
OHIO PORTION OF LAKE ERIE BASIN
JUNE, 1969
BY RIVER BASINS

ENTITY	REQUIREMENTS	APPROVED SCHEDULE OF PLANS AND CONSTRUCTION	REMARKS
		BLACK RIVER BASIN	
AVON	NEW SECONDARY PLANT TO SERVE ENTIRE CITY	DP 6-15-68 COMPL. 12-15-69	ORDERED TO AUTHORIZE THE PREPARATION OF DETAIL PLANS BY 8/69. BUILDING FREEZE IMPOSED. STUDYING INCLUSION IN FRENCH CRK. PROJECT
LORAIN	IMPROVEMENTS + SECONDARY TREAT.	R & GP 3-15-67 DP 6-20-68 COMPL. 12-15-70	DETAIL PLANS APPROVED 8/68 RECEIVING BIDS
		CHAGRIN RIVER BASIN	
AURORA	IMPROVEMENTS	DP 4-15-67 COMPL. 10-15-69	DETAIL PLANS APPROVED 8/67. U.C. - TO BE COMPLETED THIS YEAR
GEAUGA CO. BAINBRIDGE TWP. SD #3	INSTALL SEWERS AND CONNECT TO CHAGRIN FALLS	SCHEDULE PENDING NEGOTIOATION	NEGOTIATION UNDER WAY
		CUYAHOGA RIVER BASIN	
AKRON	1. ADDITIONAL SECONDARY FAC. 2. ADDITIONAL PRIMARY FAC. 3. ADDITIONAL SLUDGE DEWATERING FAC.	COMPL. 6/69 COMPL. 1/71	1. COMPLETION 7/69 2. UNDER CONSTRUCTION - COMPLETE 1970 3. PLANS IN PREPARATION
CLEVELAND -SOUTHERLY	ENLARGEMENT	COMPL. 12/69	UNDER CONSTRUCTION
INDEPENDENCE	NEW SECONDARY PLANT	R & GP 6-15-67 DP 6-15-68 COMPL. 12-15-69	ORDER TO PREPARE DETAIL PLANS BY 10/69. BUILDING FREEZE IMPOSED
MANTUA	NEW SECONDARY PLANT	COMPL. 4-15-68	COMPLETED '68
MIDDLEFIELD	IMPROVEMENTS + SECONDARY TREAT.	DP 6-15-67 COMPL. 8-15-68	DETAIL PLANS APPROVED 6/67. ARRANGING FINANCES THROUGH FHA

TABLE 1. - CONTINUED

ENTITY	REQUIREMENTS	APPROVED SCHEDULE OF PLANS AND CONSTRUCTION	REMARKS
		CUYAHOGA RIVER BASIN - CON'T.	
MUNROE FALLS	CONNECT TO AKRON		CONNECTION EXPECTED 9/69
OAKWOOD	NEW SECONDARY PLANT	R & GP 3-15-67 DP 7-15-67 COMPL. 9-15-68	ORDERED TO PREPARE A REVISED REPORT AND GENERAL PLAN BY 8/69. BUILDING FREEZE IMPOSED.
CUYAHOGA CO. BRECKSVILLE SD #13 BRECKSVILLE	ADDITIONAL SEWERS PLANT ENLARGEMENT	R & GP 12-15-67 DP 1-15-69	DATE FOR REVISED R & GP EXTENDED TO 8/69.
SUMMIT CO. STOW TWP. SD #4	CONNECT TO MUD BROOK INTERCEPTOR	NO SCHEDULE DUE TO LITIGATION	UNDER CONSTRUCTION COMPLETION EXPECTED 9/69
		GRAND RIVER BASIN	
PAINESVILLE	IMPROVEMENTS + ADD SECONDARY UNITS	R & GP 12-31-67 DP 9-30-68 COMPL. 12-31-70	REPORT AND GENERAL PLAN APPROVED 4/69. DATE FOR DETAIL PLANS EXTENDED TO 12/69 FOR ENLARGED SERVICE AREA.
FAIRPORT HARBOR	ADD SECONDARY UNITS	R & GP 7-15-67 DP 5-15-68 COMPL. 10-15-70	PLAN CONNECTION TO PAINESVILLE
GRAND RIVER	NEW SECONDARY PLANT	DP 12-15-67 COMPL. 12-15-69	PLAN CONNECTION TO A NEW LAKE CO. TREATMENT FACILITY
ORWELL	NEW SECONDARY PLANT	DP 3-15-67 COMPL. 11-15-68	COMPLETED 6/69
		HURON RIVER BASIN	
HURON	ADD SECONDARY UNITS	R & GP 6-15-67 DP 6-15-68 COMPL. 11-15-70	DATE FOR REPORT AND GENERAL PLAN EXTENDED TO 3/70. PLANS TO INCLUDE TREATMENT OF A NEW MAJOR INDUSTRIAL WASTE LOAD.
NORWALK	ENLARGEMENT OF SECONDARY TREATMENT FACILITIES	COMPL. 12-15-68	NEAR COMPLETION

TABLE 1. - CONTINUED

ENTITY	REQUIREMENTS	APPROVED SCHEDULE OF PLANS AND CONSTRUCTION	REMARKS
		HURON RIVER BASIN - CON'T	
MILAN	NEW SECONDARY PLANT	NO SCHEDULE	COMPLETED 3/68
MONROEVILLE	ADD SECONDARY UNIT	R & GP 6-15-67 DP 6-15-68 COMPL. 12-15-69	TO SUBMIT DETAIL PLANS AND PLACE UNDER CONSTRUCTION BEFORE 12/69
		MAUMEE RIVER BASIN	
DEFIANCE	ADD SECONDARY UNIT	DP 9-15-67 COMPL. 8-15-69	DETAIL PLANS APPROVED 9/68. CONTRACTS AWARDED 4/69.
DELPHOS	ADDITIONAL TREATMENT FACILITIES	R & GP 3-15-68 DP 3-15-69 COMPL. 9-15-70	DATE FOR REPORT AND GENERAL PLAN EXTENDED TO 7/69
FINDLAY	IMPROVEMENTS	DP 7-15-67 COMPL. 6-15-69	DETAIL PLANS APPROVED 12/67. UNDER CONSTRUCTION-TO BE COMPLETED 7/70.
PERRYSBURG	ADD SECONDARY UNITS	R & GP 6-15-67 DP 6-30-68 COMPL. 12-31-69	REPORT AND GENERAL PLAN APPROVED 12/68. PLAN CONNECTION TO LUCAS CO. METROPOLITAN SEWER DISTRICT.
ST. MARYS	IMPROVEMENTS	DP 6-15-67 COMPL. 6-15-69	DETAIL PLANS APPROVED 7/67. UNDER CONSTRUCTION-TO BE COMPLETED 8/69.
TOLEDO	IMPROVEMENTS TO TREATMENT FAC.	R & GP 7-15-67 DP 8-15-68 COMPL. 12-15-69	DATE FOR DETAIL PLANS EXTENDED TO 6-15-69. DETAIL PLANS EXPECTED IN 9/69.
VAN WERT	IMPROVEMENTS	R & GP 5-15-67 DP 8-15-68 COMPL. 12-15-69	DATE FOR DETAIL PLANS EXTENDED TO 8-15-69
ANTWERP	NEW SECONDARY PLANT	R & GP 6-15-67 DP 6-15-68 COMPL. 12-15-69	REPORT AND GENERAL PLAN APPROVED 8/68. DATE FOR DETAIL PLANS EXTENDED TO 10-15-69.
HAMLER	NEW SECONDARY PLANT	DP 5-15-68 COMPL. 12-15-69	DATE FOR DETAIL PLANS TO BE EXTENDED

TABLE 1. - CONTINUED

ENTITY	REQUIREMENTS	APPROVED SCHEDULE OF PLANS AND CONSTRUCTION	REMARKS
		MAUMEE RIVER BASIN - CON'T.	
HASKINS	ADD SECONDARY UNITS	R & GP 5-15-67 DP 7-15-68 COMPL. 12-15-69	REPORT AND GENERAL PLAN AWAITING APPROVAL
HOLGATE	NEW SECONDARY PLANT	DP 3-15-67 COMPL. 5-30-68	WPCB PERMIT DENIED. HEARING SET AUGUST 1969.
LIBERTY CENTER	NEW SECONDARY PLANT	R & GP 9-15-67 DP 7-15-68 COMPL. 12-15-69	REVISED REPORT AND GENERAL PLAN IN PREPARATION DATE EXTENDED TO 2/69.
MONTPELIER	ADD SECONDARY UNITS	DP 2-15-68 COMPL. 12-15-69	DATE FOR DETAIL PLANS EXTENDED TO 8/69
NORTHWOOD	1. CONNECT WEST SIDE TO TOLEDO 2. CONNECT EAST SIDE TO WOOD CRK.	NO SCHEDULE	1. SEWERS UNDER CONSTRUCTION 2. PLANS IN PREPARATION
OHIO CITY	NEW SECONDARY PLANT	DP 8-1-67 COMPL. 12-15-68	DETAIL PLANS APPROVED 12/67. UNDER CONSTRUCTION-COMPLETION THIS YEAR.
OTTAWA	ENLARGEMENT	R & GP 7-15-67 DP 7-15-68 COMPL. 12-30-69	DETAIL PLANS APPROVED 1/69. UNDER CONSTRUCTION-COMPLETION THIS YEAR.
PANDORA	NEW SECONDARY PLANT	COMPL. 1-15-69	ORDERED TO PLACE UNDER CONSTRUCTION BY 10/69. BUILDING FREEZE IMPOSED.
ROCKFORD	ADD SECONDARY UNITS	R & GP 9-15-67 DP 4-15-68 COMPL. 8-15-69	DATE FOR DETAIL PLANS EXTENDED TO 4/70
SHERWOOD	ADD SECONDARY UNITS	R & GP 8-15-67 DP 5-15-68 COMPL. 9-15-69	DATE FOR DETAIL PLANS EXTENDED TO 4/70. CHANGED ENGINEERS.
WATERVILLE	ENLARGEMENTS	R & GP 7-15-67 DP 7-15-68 COMPL. 12-15-69	PLANNING CONNECTION TO A NEW LUCAS CO. PLANT

TABLE 1. - CONTINUED

ENTITY	REQUIREMENTS	APPROVED SCHEDULE OF PLANS AND CONSTRUCTION	REMARKS
		MAUMEE RIVER BASIN - CON'T.	
WEST UNITY	NEW SECONDARY PLANT	DP 6-15-67 COMPL. 12-15-69	ORDERED TO COMPLETE DETAIL PLANS AND PLACE UNDER CONSTRUCTION BY 9/69.
LUCAS CO. METROPOLITAN SD HOLLAND SUBDISTRICT	NEW SECONDARY PLANT	DP 6-1-67 COMPL. 1-15-69	PLANS FOR TRUNK SEWER APPROVED 7/68
		PORTAGE RIVER BASIN	
PORT CLINTON	ADD SECONDARY UNIT	DP 6-15-67 COMPL. 4-15-69	DETAIL PLANS APPROVED 7/68. READY FOR CONSTRUCTION.
BLOOMDALE	NEW SECONDARY PLANT	DP 2-15-68 COMPL. 12.15-69	DETAIL PLANS APPROVED 6/68. UNDER CONSTRUCTION-COMPLETE 3/70.
ELMORE	NEW SECONDARY PLANT	DP 12-15-67 COMPL. 12-15-69	COMPLETED 6/69
McCOMB	ADD SECONDARY UNITS	COMPL. 12-15-68	COMPLETED 4/69
OAK HARBOR	ADD SECONDARY UNITS	R & GP 8-15-67 DP 8-15-68 COMPL. 12-15-69	REPORT AND GENERAL PLAN APPROVED 12/68. EXTENTION OF DATE FOR DETAIL PLANS NOW PENDING.
PEMBERVILLE	NEW SECONDARY PLANT	R & GP 6-15-67 DP 12-15-68 COMPL. 12-15-69	DETAIL PLANS APPROVED 5/69. CONSTRUCTION TO BEGIN 8/69.
WOODVILLE	NEW SECONDARY PLANT	R & GP 8-15-67 DP 8-15-68 COMPL. 12-15-69	DETAIL PLANS APPROVED 10/68. PLACED UNDER CONSTRUCTION 5/69 COMPLETION 7/70
		ROCKY RIVER BASIN	
BEREA	ENLARGEMENT	COMPL. 6-1-69	COMPLETED 11/68
BROADVIEW HEIGHTS	NEW SECONDARY PLANT	DP 1-1-68 COMPL. 12-31-70	ORDER TO PREPARE DETAIL PLAN BY 8/69. BUILDING FREEZE IMPOSED.

TABLE 1. - CONTINUED

ENTITY	REQUIREMENTS	APPROVED SCHEDULE OF PLANS AND CONSTRUCTION	REMARKS
		ROCKY RIVER BASIN - CON'T.	
MIDDLEBURGH HEIGHTS	NEW SECONDARY PLANT REPLACING TWO EXISTING PLANTS	COMPL. 12/68	CONSTRUCTION TO BE COMPLETED 12/69
OLMSTED FALLS	NEW SECONDARY PLANT	COMPL. 8/69	BIDS OVER ESTIMATED REWORKING FINANCES
LORAIN CO. SD #60 WEST VIEW PARK SUBD.	NEW SECONDARY PLANT	R & GP 3-1-67 DP 6-1-67 COMPL. 12-1-68	DETAIL PLANS APPROVED 9/67. UNDER CONSTRUCTION-TO BE COMPLETED 8/69.
		SANDUSKY RIVER BASIN	
TIFFIN	IMPROVEMENTS	COMPL. 7-15-68	PLANT IMPROVEMENTS COMPLETED 10/68. SEWER IMPROVEMENTS TO BE COMPLETED 3/70.
ATTICA	NEW SECONDARY PLANT	R & GP 6-15-67 DP 6-15-68 COMPL. 12-15-69	REPORT AND GENERAL PLAN APPROVED 8/68. DATE FOR DETAIL PLANS EXTENDED TO 7/69.
BLOOMVILLE	NEW SECONDARY PLANT	R & GP 8-15-67 DP 6-15-68 COMPL. 12-15-69	DETAIL PLANS APPROVED 10/68. UNDER CONSTRUCTION TO BE COMPLETED 3/70.
UPPER SANDUSKY	PLANT ENLARGEMENT	R & GP 3-15-68 DP 3-15-69 COMPL. 9-15-70	DATE FOR DETAIL PLANS EXTENDED TO 5/70. RECENTLY PASSED A BOND ISSUE.
SANDUSKY CO. SD #1	SEWERS WITH CONNECTION TO FREMONT	DP 1-15-68 COMPL. 1969	DETAIL PLANS APPROVED 2/69. NO ACTION ON CONSTRUCTION. SHOW CAUSE HEARING 9/69.
SENECA CO. CLINTON TWP.	SEWERS WITH CONNECTION TO TIFFIN	DP 11-15-67 COMPL. 1968	PLANS FOR ONLY PART OF PROJECT APPROVED
		VERMILION RIVER BASIN	
VERMILION	NEW SECONDARY PLANT REPLACING EXISTING FACILITIES	COMPL. 3/69	COMPLETED 12/68

TABLE 1. - CONTINUED

ENTITY	REQUIREMENTS	APPROVED SCHEDULE OF PLANS AND CONSTRUCTION	REMARKS
MINOR TRIBUTARIES TO LAKE ERIE			
AMHERST	PLANT ENLARGEMENT	R & GP 12-15-67 DP 12-15-68 COMPL. 6-15-70	PREPARING REVISED REPORT AND GENERAL PLAN. DATE EXTENDED TO 3/70.
BELLEVUE	NEW SECONDARY PLANT	COMPL. 9-1-69	UNDER CONSTRUCTION
CONNEAUT	IMPROVEMENTS + SECONDARY UNITS	R & GP 3-15-67 DP 1-15-68 COMPL. 10-15-69	REPORT AND GENERAL PLAN APPROVED 7/67. DATE FOR DETAIL PLANS EXTENDED TO 5/70
WESTLAKE	CONNECT TO COUNTY SEWER SYSTEM	NO SCHEDULE DUE TO LITIGATION	SEWERS UNDER CONSTRUCTION
GREEN SPRINGS	ADD SECONDARY UNITS	DP 7-15-67 COMPL. 12-15-68	REVISED DETAIL PLANS APPROVED 12/68. CONSTRUCTION DATE EXTENDED TO 1/70.
ERIE CO. PERKINS-MARGARETTA SD SUBDISTRICT B	CONNECT TO SANDUSKY	DP 8-1-68 COMPL. 12-15-69	DETAIL PLANS APPROVED 1/69. SEWERS UNDER CONSTRUCTION.
DISCHARGES DIRECT TO LAKE ERIE			
ASHTABULA	ADD SECONDARY UNITS	R & GP 3-15-67 DP 6-15-68 COMPL. 10-30-70	DETAIL PLANS APPROVED 7/68. BIDS TAKEN IN 5/69.
AVON LAKE	ADD SECONDARY UNITS	DP 2-15-68 COMPL. 1970	DETAIL PLANS EXPECTED SHORTLY
CLEVELAND			
- WESTERLY	ADD SECONDARY UNIT	DP 6/69 COMPL. 12/71	REVISED REPORT AND GENERAL PLANS IN PREPARATION.
- EASTERLY	ENLARGEMENT	DP 6/68 COMPL. 7/70	REVISED REPORT AND GENERAL PLANS IN PREPARATION.
EUCLID	ADD SECONDARY UNITS	R & GP 5-1-67 DP 6-1-68 COMPL. 6-30-70	PLANT SITE LOCATION PROBLEMS

TABLE 1. - CONTINUED

ENTITY	REQUIREMENTS	APPROVED SCHEDULE OF PLANS AND CONSTRUCTION	REMARKS
		DISCHARGES DIRECT TO LAKE ERIE - CON'T.	
OREGON	NEW SECONDARY PLANT	DP 7-30-68 COMPL. 12-30-69	UNDER CONSTRUCTION. DETAIL PLANS APPROVED 9/67.
SANDUSKY	ADD SECONDARY UNITS	DP 6-30-68 COMPL. 11-30-70	DETAIL PLANS APPROVED 4/69
WILLOUGHBY - EASTLAKE	ADD SECONDARY UNITS	R & GP 4-15-67 DP 7-15-68 COMPL. 7-15-70	DATE FOR DETAIL PLANS EXTENDED TO 9/69
WILLOUGHBY - MENTOR SD	ADD SECONDARY UNITS	R & GP 1-1-68 DP 1-1-69 COMPL. 1-1-71	DATE FOR DETAIL PLANS EXTENDED TO 9/69
GENEVA-ON-THE-LAKE	ADD SECONDARY UNITS	R & GP 6-15-67 DP 6-15-68 COMPL. 7-15-70	REPORT AND GENERAL PLAN APPROVED 2/68. DATE FOR DETAIL PLANS EXTENDED TO 6/70.
CUYAHOGA CO. ROCKY RIVER SD	ADD SECONDARY UNITS	DP 6-15-67 COMPL. 9-15-69	PLANS EXPECTED 6/69
ERIE CO. RUGGLES BEACH MITTIWANGA	ADD SECONDARY UNITS	R & GP 3-1-67 DP 8-1-68	REVISED REPORT AND GENERAL PLANS APPROVED 4/69

TABLE 2. STATUS OF INDUSTRIAL WASTES TREATMENT OR REDUCTION FACILITIES
OHIO PORTION OF LAKE ERIE BASIN
JUNE, 1969
BY RIVER BASINS

ENTITY	REQUIREMENTS	APPROVED SCHEDULE OF PLANS AND CONSTRUCTION	REMARKS
		ASHTABULA RIVER BASIN	
CABOT TITANIA CORPORATION TITANIUM DIOXIDE PLANT	ADDITIONAL FACILITIES FOR SOLIDS REMOVAL	COMPL. 9/69	UNDER CONSTRUCTION
CABOT TITANIA CORPORATION TITANIUM TETRACHLORIDE UNIT	IN-PLANT CHANGES	COMPL. 6/69	UNDER CONSTRUCTION
DETREX CHEMICAL INDUSTRIES, INC. CHLORINATED SOLVENTS DIV.	ADDITIONAL CONTROL FACILITIES	COMPL. 7/68	UNDER CONSTRUCTION COMPLETION DATE EXTENDED TO 9/69
REACTIVE METALS, INC. METALS REDUCTION PLANT	ADDITIONAL FACILITIES FOR SOLIDS REMOVAL	DP 6/67 COMPL. 4/69	COMPLETED
		BLACK RIVER BASIN	
REPUBLIC STEEL CORPORATION STEEL & TUBES DIV. (ACID IRON)	ACID NEUTRALIZATION OR ELIMINATION	DP 6/68 COMPL. 12/69	REDUCING AMOUNT OF ACID USED BY PROCESS CHANGES
UNITED STATES STEEL CORPORATION TUBULAR OPERATION (BLAST FURNACE)	ADDITIONAL REDUCTION OF SOLIDS	COMPL. 1/70	DETAIL PLANS EXPECTED 8/69
		CHAGRIN RIVER BASIN	
CHASE BAG CO.	SECONDARY TREATMENT FACILITIES	DP 12/69 COMPL. 12/70	PLANS IN PREPARATION
		CUYAHOGA RIVER BASIN	
ALSIDE HOMES CORPORATION DIV. OF ALSIDE, INC.	CONNECT TO MUD BROOK INTERCEPTOR	COMPL. 9/69	COMPLETION 9/69
ASTORIA PLATING CORPORATION	PERMANENT PRE-TREATMENT FACILITIES CONNECT TO MUNICIPAL SEWERS	DP 4/67 COMPL. 6/68 COMPL. 9/69	TREATMENT FACILITIES COMPLETED. WILL CONNECT TO MUNICIPAL SEWERS. UNDER CONSTRUCTION

TABLE 2. - CONTINUED

ENTITY	REQUIREMENTS	APPROVED SCHEDULE OF PLANS AND CONSTRUCTION	REMARKS
		CUYAHOGA RIVER BASIN - CON'T.	
BEDFORD GEAR AND MACHINE PRODUCTS CO.	NEW TREATMENT FACILITIES	COMPL. 9/69	UNDER CONSTRUCTION
CONSOLIDATED FREIGHTWAYS	STUDIES RE., IMPROVED TREATMENT AND WATER REUSE	COMPL. 11/69	PLAN IN PREPARATION
THE CORNWELL QUALITY TOOLS CO.	TREATMENT FACILITIES FOR Cr & CN	DP 12/69 COMPL. 12/70	SMALL PLATING OPERATION
THE CUYAHOGA MEAT CO.	ADDITIONAL TREATMENT FACILITIES	DP 6/69 COMPL. 10/69	CONSTRUCTION THIS YEAR
THE FIRESTONE TIRE AND RUBBER CO. (AKRON PLANT)	REDUCTION OF OILS AND SUSPENDED SOLIDS	DP 1/68 COMPL. 1/69	75% OF PROJECTS COMPLETED. REMAINING BY 9/69.
FORD MOTOR CO. ENGINE PLANTS 1 & 2	CONNECT TO MUNICIPAL SEWERS	DP 6/68 COMPL. 6/69	DETAIL PLANS APPROVED. UNDER CONSTRUCTION.
GENERAL TIRE AND RUBBER CO. (AKRON PLANT)	REDUCTION OF OILS AND SUSPENDED SOLIDS	DP 1/68 COMPL. 1/69	PRE-TREATMENT FACILITIES INSTALLED. CONNECT TO MUNICIPAL SEWERS.
THE B. F. GOODRICH CO. (AKRON PLANT)	REDUCTION OF ALL CRITICAL CONSTITUENTS	DP 1/68 COMPL. 1/69	ONE PROJECT COMPLETED 9/68. PLANNING OTHERS.
GOODYEAR AEROSPACE CORPORATION (AKRON PLANT)	FACILITIES FOR PRE-TREATMENT AND DISCHARGE TO MUNICIPAL SEWERS	DP 6/67 COMPL. 6/68	COMPLETED 2/69
THE GOODYEAR TIRE AND RUBBER CO. (AKRON PLANT)	REDUCTION OF ALL CRITICAL CONSTITUENTS	DP 1/68 COMPL. 1/69	REVISED DETAIL PLANS APPROVED 12/68. UNDER CONSTRUCTION. COMPLETION EXPECTED 9/69.
THE HARSHAW CHEMICAL CO. DIV. OF KEWANEE OIL CO.	REDUCTION OF METALS AND SOLIDS	DP 7/69 COMPL. 7/70	REDUCTION OF METALS COMPLETED.
JONES AND LAUGHLIN STEEL CORP. (STEEL - ACID IRON)	EVALUATION OF EFFECTS OF RINSE WATER DISCHARGE	DP 6/67 COMPL. 12/69	STUDIES UNDERWAY. STRONG ACIDS HAULED AWAY.
JONES AND LAUGHLIN STEEL CORP. (STEEL - BLAST FURNACE)	IMPROVED REDUCTION OF SOLIDS	DP 6/68 COMPL. 12/69	COMPLETED 12/68

TABLE 2. - CONTINUED

ENTITY	REQUIREMENTS	APPROVED SCHEDULE OF PLANS AND CONSTRUCTION	REMARKS
		CUYAHOGA RIVER BASIN - CON'T.	
LERKIS ASPHALT CO., INC.	ADDITIONAL FACILITIES AND IMPROVED OPERATIONS	DP 3/69 COMPL. 5/69	COMPLETED
M AND M SAND AND GRAVEL CO., INC.	ADDITIONAL CLARIFICATION FACILITIES	DP 3/69 COMPL. 4/69	COMPLETED
MASTER ANODIZERS & PLATERS, INC.	ADDITIONAL TREATMENT FACILITIES	COMPL. 8/69	COMPLETED. FURTHER IMPROVEMENTS UNDER STUDY.
MIDDLEFIELD SWISS CHEESE CO-OP ASSOCIATION	ADDITIONAL FACILITIES	DP 5/69 COMPL. 10/69	NO ACTION. CONFERENCE 7/69.
MODERN TOOL AND DIE CO.	NEW TREATMENT FACILITIES	DP 7/69 COMPL. 12/69	PLANS IN PREPARATION. ON SCHEDULE.
OHIO EDISON CO. GORGE PLANT	SANITARY WASTE TREATMENT	DP 10/68 COMPL. 3/69	COMPLETED 1969
REPUBLIC STEEL CORPORATION			
BOLT AND NUT DIV. (STEEL - ACID IRON)	REMOVAL OR TREATMENT OF WASTE PICKLING LIQUOR	DP 6/68 COMPL. 1/70	STUDY UNDERWAY
CLEVELAND DISTRICT (STEEL - ACID IRON)	REMOVAL OR TREATMENT OF WASTE PICKLING LIQUORS	DP 6/68 COMPL. 12/69	STRONG ACIDS HAULED AWAY
CLEVELAND DISTRICT (STEEL - BLAST FURNACE)	IMPROVED REDUCTION OF SUSPENDED SOLIDS	DP 6/68 COMPL. 1/70	PLANS APPROVED. UNDER CONSTRUCTION.
CLEVELAND DISTRICT (STEEL - MILL SCALE)	IMPROVED REDUCTION OF SUSPENDED SOLIDS	DP COMPL. 1/70	PLANS APPROVED. UNDER CONSTRUCTION.
SMALLWOOD PACKING CO., INC.	ADDITIONAL TREATMENT FACILITIES	DP 6/69	CONSTRUCTION 1969
SONOCO PRODUCTS CO. OHIO DIV.	CONNECT TO MUD BROOK INTERCEPTOR	COMPL. 6/69	COMPLETION 9/69
UNITED STATES STEEL CORP.			
CENTRAL FURNACES (STEEL - BLAST FURNACE)	ADDITIONAL REDUCTION OF SUSPENDED SOLIDS	DP 7/68 COMPL. 12/69	

TABLE 2. - CONTINUED

ENTITY	REQUIREMENTS	APPROVED SCHEDULE OF PLANS AND CONSTRUCTION	REMARKS
	CUYAHOGA RIVER BASIN - CON'T.		
UNITED STATES STEEL CORP. - CON'T.			
CUYAHOGA WORKS (STEEL - ACID IRON)	REMOVAL OF PICKLING ACIDS AND REMOVAL OF SOLIDS AND METALS	DP 3/67 COMPL. 12/68	STRONG ACIDS HAULED AWAY
CUYAHOGA WORKS (STEEL - MILL SCALE)	ADDITIONAL REDUCTION OF SUSPENDED SOLIDS AND OIL	DP 3/67 COMPL. 12/68	COMPLETED 7/68
WEATHER-TITE DIV. PACIFIC COAST CO.	IMPROVED NEUTRALIZATION AND REDUCTION OF SOLIDS	DP COMPL. 9/69	PLANS APPROVED. COMPLETION BY 10/69.
	GRAND RIVER BASIN		
CALHIO CHEMICALS, INC.	IMPROVEMENTS	DP 7/69 COMPL. 12/69	DATE FOR PLANS EXTENDED TO 12/69. CONSTRUCTION 1970
THE METAL CRAFT CO.	NEUTRALIZATION AND REDUCTION OF SOLIDS	DP 4/67 COMPL. 6/68	COMPLETED 6/68
A. E. STALEY MANUFACTURING CO.	DISCHARGE TO MUNICIPAL SEWERS WHEN AVAILABLE		AWAITING SEWERS
UNIROYAL CHEMICAL DIV. UNIROYAL, INC. PLANT AREA #1	ADDITIONAL FACILITIES FOR SOLIDS, OXYGEN DEMANDING MATERIAL AND SOLIDS	DP 10/68 COMPL. 12/69	PLANS APPROVED 10/68. UNDER CONSTRUCTION
UNIROYAL CHEMICAL DIV. UNIROYAL, INC. PLANT AREA #4	NEW TREATMENT FACILITIES	DP 10/68 COMPL. 12/69	PLANS APPROVED 10/68. UNDER CONSTRUCTION.
	HURON RIVER BASIN		
THE BALTIMORE AND OHIO RAILROAD CO.	ADDITIONAL FACILITIES FOR REMOVAL OF OIL	DP 6/69 COMPL. 1/70	DETAIL PLANS IN PREPARATION
CLEVITE CORPORATION HARRIS DIV. (MILAN PLANT)	ADDITIONAL FACILITIES FOR NEUTRALIZATION AND REDUCTION OF METALS AND SOLIDS	DP 7/67 COMPL. 7/68	COMPLETED 9/68

TABLE 2. - CONTINUED

ENTITY	REQUIREMENTS	APPROVED SCHEDULE OF PLANS AND CONSTRUCTION	REMARKS
		MAUMEE RIVER BASIN	
BOHRER AND MOORE PACKAGING CO., INC.	CONNECT TO MUNICIPAL SEWER	COMPL. 11/69	PLANS IN PREPARATION
CAMPBELL SOUP CO.	ADDITIONAL FACILITIES	DP 1/67 COMPL. 7/69	DETAIL PLANS APPROVED. UNDER CONSTRUCTION. COMPLETION THIS YEAR.
CENTRAL FOUNDRY DIV. GENERAL MOTORS CORP.	ADDITIONAL SOLIDS REDUCTION	COMPL. 6/68	COMPLETED 7/68
CLEVITE CORPORATION HARRIS DIV. (NAPOLEON PLANT)	ADDITIONAL FACILITIES NEUTRALIZATION, REDUCTION OF METALS AND SOLIDS	DP 7/67 COMPL. 7/68	COMPLETED 9/68
DANA CORPORATION TRANSMISSION DIV.	IMPROVED OIL REMOVAL	DP 9/69 COMPL. 7/70	PLANS IN PREPARATION
ELITE PLATING DIV. DYNAVEST CORP.	REDUCTION OF METALS AND CYANIDE, NEUTRALIZATION	DP 12/69 COMPL. 7/70	REVISED DETAIL PLANS IN PREPARATION. ELIMINATED CN PLATING.
EXCELLO CORPORATION	CONNECT TO MUNICIPAL SEWERS	COMPL. 4/70	NEGOTIATING WITH CITY RE REQUIREMENTS
INTERLAKE STEEL CORP.	ADDITIONAL REDUCTION OF SOLIDS	DP 9/68 COMPL. 8/69	PLANS APPROVED. UNDER CONSTRUCTION. COMPLETION 1970.
JOHN-MANVILLE FIBER GLASS, INC. (WATERVILLE PLANT)	ADDITIONAL FACILITIES	DP 8/69 COMPL. 12/69	COMPLETED
LIBBY, McNEILL & LIBBY	ADDITIONAL FACILITIES	DP 6/67 COMPL. 8/67	COMPLETED, HOWEVER FURTHER IMPROVEMENTS REQUIRED
PLAIN VIEW FARM	PROVIDE FOR WINTER OPERATION	COMPL. 10/69	COMPLETED
REPUBLIC CREOSOTING CO. DIV. REILLY TAR & CHEMICAL CORP.	REDUCTION OF PHENOLICS AND OIL	DP 1/68 COMPL. 1/69	COMPLETED 5/69
RUSCO DIV. RUSCO INDUSTRIES, INC.	CONNECT TO MUNICIPAL SEWER	COMPL. 12/70	NEGOTIATING WITH VILLAGE
S-K WAYNE TOOL DIV. DRESSER INDUSTRIES, INC.	CONNECT TO MUNICIPAL SEWER	COMPL. 9/69	PLANS APPROVED. START CONSTRUCTION THIS YEAR.

TABLE 2. - CONTINUED

ENTITY	REQUIREMENTS	APPROVED SCHEDULE OF PLANS AND CONSTRUCTION	REMARKS
		MAUMEE RIVER BASIN - CON'T.	
VISTRON CORPORATION NITROGEN PLANT	TREATMENT FACILITIES FOR NEW PLANT	COMPL. 4/70	SOME PROJECTS COMPLETED
VISTRON CORPORATION ACRYLONITRILE PLANT	ADDITIONAL REDUCTION OF NITROGEN COMPOUNDS AND OXYGEN DEMAND	DP 1/68 COMPL. 1/69	NEW DISPOSAL WELL UNDER CONSTRUCTION
STOKELY-VAN CAMP, INC.	IN PLANT CORRECTIONS	COMPL. 8/69	UNDER CONSTRUCTION
WEATHERHEAD CO.	ADDITIONAL REDUCTION OF METALS AND SOLIDS	DP 6/67 COMPL. 9/68	COMPLETED 9/68
		PORTAGE RIVER BASIN	
THE GREAT ATLANTIC AND PACIFIC TEA CORP., INC. ANN PAGE DIV.	ADDITIONAL FACILTIES AND IMPROVEMENTS TO EXISTING FACILITIES	COMPL. 8/69	UNDER CONSTRUCTION
THE SENECA WIRE AND MANUFACTURING COMPANY	ADDITIONAL FACILITIES FOR METALS AND SOLIDS	DP 1/68 COMPL. 12/69	STUDIES IN IN-PLANT IMPROVEMENTS AND PROCESS CHANGES UNDER WAY.
SWIFT AND COMPANY	CONNECT TO MUNICIPAL SEWER WHEN AVAILABLE		
		SANDUSKY RIVER BASIN	
NORTHERN OHIO SUGAR CO.	ADDITIONAL REDUCTION OF OXYGEN DEMAND. CONNECT TO MUNICIPAL SEWER WHEN AVAILABLE.	DP 12/68 COMPL. 12/69	ADDITIONAL FACILITIES COMPLETED. NEGOTIATING FOR DISCHARGE TO MUNICIPAL SEWERS.
THE PIONEER RUBBER CO. PLANT #2	CONNECT TO MUNICIPAL SEWER WHEN AVAILABLE	NO SCHEDULE	SEE ATTICA
PPG INDUSTRIES, INC. WORKS #26	NEW FACILITIES	DP 4/69 COMPL. 6/70	DETAIL PLANS APPROVED 4/69

TABLE 2. - CONTINUED

ENTITY	REQUIREMENTS	APPROVED SCHEDULE OF PLANS AND CONSTRUCTION	REMARKS
	MINOR TRIBUTARIES TO LAKE ERIE		
BECHTEL-McLAUGHLIN, INC.	FACILITIES FOR NEUTRALIZATION, CHROME AND SOLIDS REDUCTION. CONNECT TO COUNTY SEWERS.	DP 2/67 COMPL. 2/68 COMPL. 9/69	NEGOTIATING CONNECTION TO COUNTY SEWER
CENTRAL SOYA CO.	ADDITIONAL FACILITIES FOR REDUCTION OF OIL. CONNECT TO MUNICIPAL SEWER WHEN AVAILABLE.	DP 6/67 COMPL. 6/68	WILL CONNECT TO MUNICIPAL SEWERS NOW UNDER CONSTRUCTION
CLEVELAND METAL CLEANING CO.	FACILITIES FOR NEUTRALIZATION AND OIL AND SOLIDS REMOVAL.	DP 6/69 COMPL. 1/70	EXPECTED BY 6-31-69
DOEHLER-JARVIS DIV. NATIONAL LEAD CO. TOLEDO PLANT #2	ADDITIONAL FACILITIES FOR REDUCTION OF METALS SOLIDS AND CYANIDE	DP 6/67 COMPL. 7/69	COMPLETED 4/69
DONN PRODUCTS, INC.	ADDITIONAL FACILITIES FOR TREATMENT OF CHROMIUM WASTE. CONNECT TO MUNICIPAL SEWERS WHEN AVAILABLE.	DP 7/67 COMPL. 1/68	TREATMENT FACILITIES COMPLETED. WILL CONNECT TO SEWERS. UNDER CONSTRUCTION.
GENERAL ELECTRIC CO. BELLEVUE LAMP PLANT #242	TO BE MADE TRIBUTARY TO MUNICIPAL SEWER.	COMPL. 9/69	WILL CONNECT TO MUNICIPAL SEWERS. UNDER CONSTRUCTION.
HIRZEL CANNING CO.	ADDITIONAL FACILITIES FOR THE MORE POSITIVE CONTROL OF WASTE	DP 2/69 COMPL. 8/69	UNDER CONSTRUCTION
THE LAKE ERIE CANNING CO.	DISCHARGE TO COUNTY SEWERS WHEN AVAILABLE		
LIBBEY-OWEN-FORD GLASS CO. EAST TOLEDO PLANT	ADDITIONAL FACILITIES FOR SOLIDS REDUCTION. ADDITIONAL FACILITIES REQUIRED. STUDY UNDER WAY.	DP 10/67 COMPL. 1/69	COMPLETED
NORFOLK AND WESTERN RAILROAD BELLEVUE YARDS	ADDITIONAL FACILITIES REQUIRED	DP 5/69 COMPL. 9/69	DETAIL PLANS APPROVED 6/69. UNDER CONSTRUCTION.
THE STANDARD OIL CO. TOLEDO REFINERY	ADDITIONAL FACILITIES REQUIRED	DP 1/68 COMPL. 1/70	UNDER CONSTRUCTION
SUN OIL COMPANY TOLEDO REFINERY	ADDITIONAL FACILITIES REQUIRED	DP 4/70 COMPL. 6/71	DETAIL PLANS IN PREPARATION

TABLE 2. - CONTINUED

ENTITY	REQUIREMENTS	APPROVED SCHEDULE OF PLANS AND CONSTRUCTION	REMARKS
	MINOR TRIBUTARIES TO LAKE ERIE - CON'T.		
TOLEDO SCALE CORPORATION DIV. OF THE RELIANCE ELECTRIC CO.	FACILITIES FOR REDUCTION OF METALS, SOLIDS AND OIL. CONNECT TO SANITARY SEWER.	DP 7/67 COMPL. 7/68	CONNECTED TO TOLEDO SEWERS 12/68
	DISCHARGES DIRECT TO LAKE ERIE		
CLEVELAND ELECTRIC ILLUMINATING CO.			
ASHTABULA PLANT	ADDITIONAL FACILITIES FOR REDUCTION OF SOLIDS	COMPL. 5/70	UNDER CONSTRUCTION
AVON PLANT	ADDITIONAL FACILITIES FOR REDUCTION OF SOLIDS	COMPL. 1/70	UNDER CONSTRUCTION
EASTLAKE GENERATING STATION	ADDITIONAL FACILITIES FOR REDUCTION OF SOLIDS	DP 7/67 COMPL. 8/69	UNDER CONSTRUCTION
LAKESHORE PLANT	ADDITIONAL FACILITIES FOR REDUCTION OF SOLIDS	COMPL. 10/69	UNDER CONSTRUCTION
IRC FIBER DIV. MIDLAND-ROSS CORP.	FACILITIES FOR NEUTRALIZATION AND REDUCTION OF ZINC AND SOLIDS	DP 2/67 COMPL. 1/69	UNDER CONSTRUCTION
TRW, INC.	ADDITIONAL FACILITIES FOR NEUTRALIZATION AND REDUCTION OF METALS AND SOLIDS	DP 12/66 COMPL. 1/69	UNDER CONSTRUCTION
UNITED STATES GYPSUM CO.	FACILITIES FOR COMPLETE TREATMENT	DP 9/68 COMPL. 12/69	UNDER CONSTRUCTION

TABLE 3. PROGRAM FOR THE REMOVAL OF PHOSPHATES FROM MUNICIPAL WASTE DISCHARGES
LAKE ERIE BASIN
JUNE, 1969

MUNICIPALITY OR OTHER ENTITY	EST. TRIB. LOAD #1 DAY P	COMPLETION DATE	REMARKS
	A. DISCHARGE DIRECTLY TO LAKE		
ASHTABULA	253	1970	DETAIL PLANS APPROVED
AVON LAKE	128	1972	GENERAL PLAN APPROVED
CLEVELAND			
-WESTERLY	2,267	1973	DETAIL PLANS IN PREPARATION
-EASTERLY	6,927	1973	DETAIL PLANS IN PREPARATION
CONNEAUT	153	1972	GENERAL PLAN APPROVED
EUCLID	1,320	1972	GENERAL PLAN APPROVED
HURON	70	1972	GENERAL PLAN IN PREPARATION
LORAIN	803	1971	RECEIVING BIDS FOR CONSTRUCTION
PORT CLINTON	76	1970	RECEIVING BIDS FOR CONSTRUCTION
ROCKY RIVER (CUYAHOGA CO. SD #6)	574	1971	DETAIL PLANS APPROVED
SANDUSKY	346	1971	DETAIL PLANS APPROVED
TOLEDO	4,282	1971	DETAIL PLANS IN PREPARATION
WILLOUGHBY			
-EASTLAKE	381	1971	GENERAL PLAN APPROVED
-MENTOR SD (LAKE CO.)	369	1971	GENERAL PLAN APPROVED
SUB-TOTAL	17,949		
	B. DISCHARGE TO TRIBUTARY STREAMS		
AKRON	3,715	1972	DETAIL PLANS IN PREPARATION
BEDFORD	178	1972	DETAIL PLANS IN PREPARATION
BEDFORD HEIGHTS	101	1970	DETAIL PLANS APPROVED
BEREA	214	1975	
BOWLING GREEN	190	1975	
CLEVELAND			
-SOUTHERLY	4,307	1973	DETAIL PLANS IN PREPARATION
DEFIANCE	170	1971	DETAIL PLANS APPROVED
ELYRIA	535	1975	
FINDLAY	360	1975	
FOSTORIA	169	1975	
FREMONT	212	1975	
KENT	285	1975	
LAKEWOOD	730	1975	
LIMA	569	1975	
MEDINA	102	1975	

TABLE 3. - CONTINUED

MUNICIPALITY OR OTHER ENTITY	EST. TRIB. LOAD #1 DAY P	COMPLETION DATE	REMARKS
	B. DISCHARGE TO TRIBUTARY STREAMS - CON'T.		
NORWALK	148	1975	
NORTH OLMSTED	281	1975	
PAINESVILLE -FAIRPORT HARBOR	228	1975	
TIFFIN	229	1975	
SUB-TOTAL	12,723		
TOTAL	30,672		

SCHEDULE OF PHOSPHATE REMOVAL

BY YEAR ENDING	TRIB. P #1 DAY	% OF OHIO MUNICIPAL TOTAL LOAD(1)
1970	430	1.2
1971	7,355	21.6
1972	12,919	38.1
1973	26,420	77.7
1975	30,672	90.4

(1) BASED ON A TOTAL MUNICIPAL LOAD OF 34,000 #/ DAY (P)

REPORT OF THE AGRICULTURAL SUB-COMMITTEE
ON ALGAE CONTROL IN LAKE ERIE

Prepared by:

Subcommittee on Agricultural Drainage

Albert P. Harness, Chairman
Chief Engineer, Ohio Utilities Company

Lawrence Rigby, Sanitary Engineer
Floyd G. Browne and Associates

Ernest C. Neal, Engineering Technician-Biologist
State of Ohio Department of Health

Presented to:

State of Ohio Department of Health
Ad Hoc Committee on Algae Control in Lake Erie

June 23, 1969

I. Historical

The Federal Water Pollution Control Administration (F.W.P.C.A.), recognizing the excessive eutrophication or aging of the Great Lakes and particularly Lake Erie, has requested each of the States in the Great Lakes Basin, in cooperation with Canada, to move rapidly toward an 80% reduction of nutrients from all municipal and industrial waste discharges as a means of retarding or eliminating algal growth in the Great Lakes and in particular the western basin of Lake Erie. The contention of the F.W.P.C.A. is extremely well documented through a series of learned reports on this subject, complete with graphs and charts which would seem to indicate that there is a direct relationship between the amount of phosphates entering the lake and the resulting growth of algae.

However, prior to committing the taxpayers of Ohio to an expenditure of many millions of dollars for this purpose the Chief of Environmental Health for the State of Ohio, in his wisdom asked several rather fundamental questions, such as:

a. What relationship, if any, is there between phosphate in-put and algal bloom?

b. What precisely constitutes a bloom?

c. What will 80% removal of phosphates from municipal and industrial discharges cost?

d. What, if any, effect would such removal have?

e. Exactly how can 80% of the nutrients, with particular attention to phosphates, be removed?

f. What natural characteristics of wind, light, water temperature, etc., might have an effect on the growth of algae?

These questions, and the absolute lack of qualified informative answers, led to the formation of an Ad Hoc Committee of interested and knowledgeable people in the field of water pollution control, to investigate all of these and many other pressing questions addressed to the subject.

A number of sub-committees were formed to look into various aspects such as technique, costs, demonstration projects, lake characteristics, lake surveillance and agricultural run-off contribution.

The latter of the above subjects was assigned to this sub-committee with the direct responsibility of seeking sources of information, determining what, if any research had, or is being done which might be of value to the committee. Determining what research projects are being planned, and determining what information might now be available. Evaluating both research projects and available information in terms which might relate to the subject at hand and to make specific recommendations for needed research projects or for implementation of programs necessary to effectively reduce the in-put of nutrients, especially phosphorous, into Lake Erie, and indeed into any of the "Waters of the State." The ensuing work of the sub-committee is reported below in chronological order rather than classification of subject matter, simply for ease of analytical concept.

II. Investigative Procedure

There are those very learned experts in the field of soils chemistry who flatly deny the possibility of any phosphates permeating the soil and entering the streams through permeation or infiltration. Further, this same group feels that any phosphates thus "locked" in the soil is instantly insoluable and therefore is not available as a nutrient if it should enter a flowing stream or body of water through erosion. Recognizing that such a phenomena might very well be true, the sub-committee first determined to open a line of communication between the Ad Hoc Committee and those people who might be familiar with agricultural practices, research and procedures.

The first meeting was held with Mr. D. T. Herman, Assistant to the Director of the State of Ohio, Department of Agriculture. At that time most of the abovementioned questions were discussed, at least in general terms and Mr. Herman wrote an Inter-Departmental memorandum to Director Stackhouse as follows:

"To: Director John M. Stackhouse
From: David T. Herman
Subject: Lake Erie POLLUTION

Mr. A. P. Harness and I met last Thursday noon to consider steps which should be taken to clarify the contribution agriculture makes to the pollution of water in Lake Erie. We concluded that you or the Director of Health, whoever is the proper person, should appoint a committee to:

1. Consider what information should be assembled before any attempt is made to evaluate agricultural contributions to the phosphate pollution of Lake Erie;
2. Suggest probable sources of each item of such information;
3. Indicate who might be made responsible for making contacts to get this information;
4. Suggest a deadline for the assembly of such information;
5. Suggest one individual or agency which might summarize the information and draft a report for consideration by the whole committee.

We feel that the committee might properly include representatives of the Departments of Agriculture, Health, and Natural Resources and of the College of Agriculture, and the Research and Development Center.

Mr. Harness and I agreed that before we ask any group to meet someone must review the decisions, reports, and other publications of the Federal Water Pollution Control Administration to determine exactly what that agency says agriculture is contributing to the Lake Erie problem.

I have the impression that the Pollution Control Administration acts and writes as if there is a direct correlation between the total phosphate content of Lake Erie water (not the phosphate in solution in the water) and algae growth in the lake. If that is their stand I wonder whether they have cited valid statistical data to support their stand.

Mr. Harness and I agree that insoluble phosphorus compounds in soil particles suspended in the water, or deposited on the bottom of the lake, probably will become soluble at some time, but we wonder whether any research indicates the rate at which such soil born compounds become soluble."

The purpose of the above referred to meeting was merely to fully acquaint the Ohio Department of Agriculture with our program and the extreme importance and urgency of proceeding in an all out attack on the problem from every source of pollution.

It is the sub-committees understanding that subsequent to this meeting and the aforementioned memorandum, through the Director of Health, Director Stackhouse has pledged his whole-hearted support toward implementation of the recommendations of the Ad Hoc Committee in carrying out research programs and working in conjunction with other State and Federal Agencies toward a total solution of the subject question.

Other than establishing a liaison with the Ohio Department of Agriculture and obtaining the support of the Director, the sub-committee only determined that the Department, at present, had little or no research underway or planned, or statistical data of value concerning the subject.

On January 15, 1969, C. M. Robinson and Donald Day of the Sanitary Engineering Division of the Ohio Department of Health participated in the 26th annual meeting of the Ohio Federation of Soil and Water Conservation Districts held in Columbus. The particular symposium in which they took part was titled, "Problems and Answers Relating to Pollution." Their assigned subject was limited to a discussion of the magnitude and steps being taken toward the solution of problems relating to solids waste disposal, a subject of great importance and interest to those in attendance but related only by implication to the subject at hand. However, members of the sub-committee found a great source of information, directly relating to the subject, in the comments of the two other speakers on the symposium.

The first speaker was Mr. Lloyd Harrold, Officer in Charge, Soil and Water Conservation Research Division, United States Department of Agriculture, Coshocton, Ohio. The sense of his remarks, as recorded by Mr. Ernest C. Neal, state co-ordinator for the sub-committee, were that:

1. Ohio is number one in the use of fertilizers in the United States.
2. Ohio is number one in the use of pesticides in the United States.
3. Ohio is number one in farm production in the United States.

However, Mr. Harrold pointed out the price of achieving this enviable position has had its price. Ohio is also number one in the nation in the production of solid waste. Nutrient enrichment in lakes and streams, caused in part by the use of N and P fertilizers has reached large proportions.

Mr. Harrold further discussed studies, presently underway to determine nutrient contribution to streams from feed lots, crop lands and wood lots. He stated that preliminary work in this area would seem to indicate that:

1. The addition of more than or less than the suggested or optimum amount of fertilizer seems to create an increase in nutrient run-off.
2. The waste deposited annually by farm animals in Ohio is approximately equivalent to that waste produced by 25 million people.
3. Algae production also occurs in streams which drain forested land.

In conclusion Mr. Harrold emphasized that agricultural pollution is already a problem of major magnitude which must be met and dealt with now.

Another speaker at this sumposium was Mr. James S. Bennett, Assistant State Conservationist, Soil Conservation Service, who addressed himself to the matter of "Soil Erosion." In his remarks he pointed out that soil erosion creates problems of huge proportion in:

1. Loss of valuable top soil.
2. Loss of fertilizer dollars.
3. Resulting fish kills.
4. Resulting increased cost of water treatment.